A CHILTON PUBLICATION

the Iron Age

E NATIONAL METALWORKING WEEKLY

June 3, 1954

ENTS PAGE 2

VALLEY MOULD & IRON CORP.

General Offices: HUBBARD, OHIO

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NOW...

FROM BUS SIGNAL TO ARC CORRECTION IN

1/20th Second

. . . AUTOMATICALLY!

Here it is . . . an electric furnace control that makes corrections as quickly as arc changes occur!

It's the Whiting Hydro-Arc Electric Furnace Control . . . a control that repositions electrodes *automatically* within 0.05 seconds after a signal is received from the electrode bus that the arc is off-balance. Maximum speed and response because: (1) usually interposed special machinery is eliminated, (2) lost motion is eliminated, (3) friction losses and inertia are reduced and, (4) the load is counterbalanced with an air cushion. Essentially a closed system, the Whiting Hydro-Arc Control uses uni-directional electrode motors that run only in one direction . . . *never reverse*. Watt (furnace heat) input is regulated from an external, fixed, unwavering standard.

Three years of research and testing *proves* the outstanding advantages of the Whiting Hydro-Arc Control. Get complete information on it now!

WHITING CORPORATION
15601 Lathrop Avenue, Harvey, Illinois
Manufacturers of a Broad Line of Foundry Equipment

Send for Bulletin FO-10 . . . it tells the entire story of the Hydro-Arc Control!

No. 124 of a Series of Typical Installations

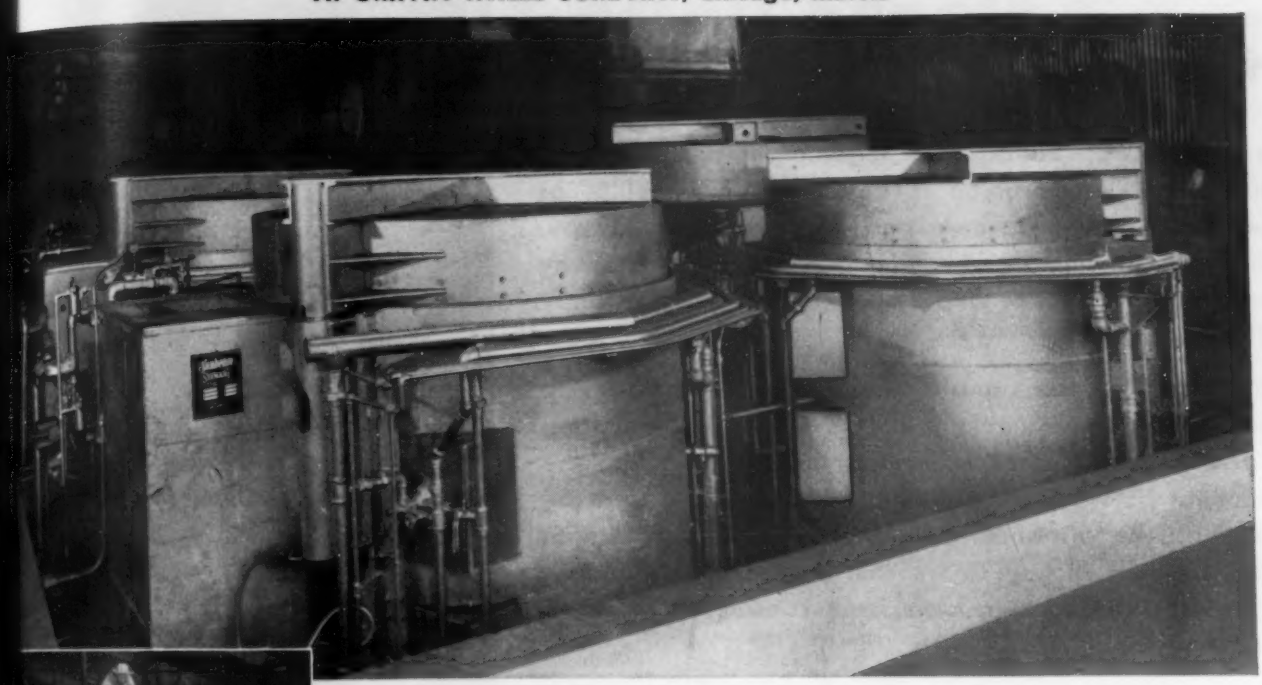
Sunbeam STEWART

THE BEST INDUSTRIAL FURNACES MADE

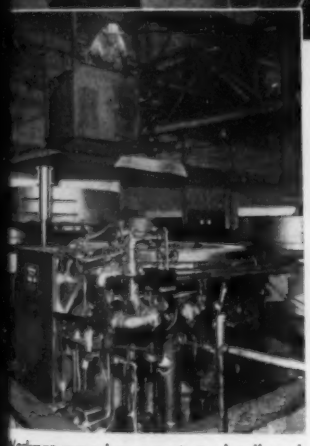
HOW SUNBEAM FURNACES HELP MANUFACTURERS REDUCE COSTS AND KEEP THEMSELVES COMPETITIVE

HEAT TREATING CAST STEEL RAILROAD WHEELS

At GRIFFIN WHEEL COMPANY, Chicago, Illinois



This Sunbeam Stewart heat treating installation consists of four direct fired furnaces having a usable pit depth of 13 feet. Griffin Wheel's method of manufacture and heat treatment has provided a wheel of high wear resistance, high strength and impact values and excellent resistance to fatigue. This program of development in perfecting the new wheel required over ten years.



Workman removing a cast steel railroad wheel from one of the four Sunbeam Stewart Furnaces. Capacity of each heat treat furnace is between 18 and 20 wheels, each weighing approximately 900 pounds.

To withstand the high stress and impact values of ever-increasing loads and speeds of modern freight cars, Griffin Wheel Company has developed and placed in manufacture a newly designed cast steel wheel, having strength values considerably greater than the present chilled cast iron wheel. To obtain the physical characteristics required, the ascast structure has to be highly refined through accurate heat treatment.

The wheels are placed in a continuous soaking oven where they are allowed to equalize at approximately 1000°F. While still at this temperature wheels are charged into one of four Sunbeam Stewart Pit-type furnaces, temperatures being raised to 1550°F. for a thorough soaking. Capacity of each heat treat furnace is between 18 and 20 wheels which is equivalent to the heat of steel as produced by the melting furnaces. The Sunbeam Stewart furnaces have a usable pit depth of 12½ feet. Wheels are supported at the bottom by hard pressed firebrick piers capped with a 14½ inch diameter high nickel chrome alloy pier-cap.

This Sunbeam Stewart furnace design provides even heating and close temperature control with minimum fuel costs. The burners are divided into two temperature control zones—one for the upper and one for the lower section of the furnace. Each is equipped with its own control valves, safety equipment and controlling and recording pyrometer.

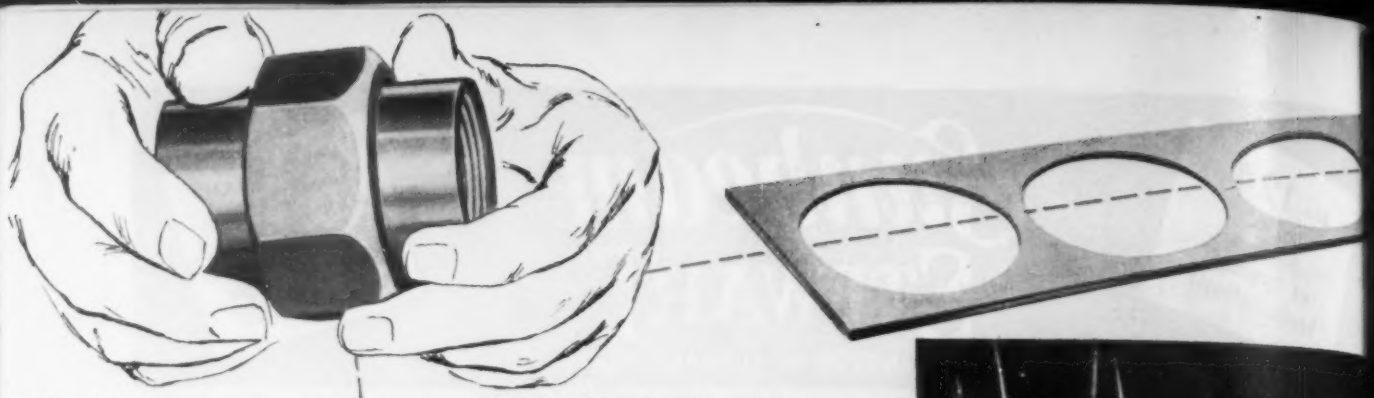
MODERN AUTOMATIC HEAT TREAT EQUIPMENT MAY BE THE ANSWER TO YOUR PROBLEM

Sunbeam engineers can help you keep pace with modern production methods. Replacement of obsolete or inefficient heat treating equipment with an automatic Sunbeam installation reduces costs, improves quality, pays for itself in a short time.

Sunbeam CORPORATION (Industrial Furnace Division)

Main Office: Dept. 110, 4433 W. Ogden Ave., Chicago 23—*New York Office:* 322 W. 48th St., New York 19—*Detroit Office:* 3049 E. Grand Blvd., Detroit 2

A letter, wire or 'phone call will promptly bring you information and details on SUNBEAM industrial furnaces, either units for which plans are now ready or units especially designed to meet your needs. Or, if you prefer, a SUNBEAM engineer will be glad to call and discuss your heat treating problems with you.



Cold Formed from SHARON Plate

(A Pipe Dream that Came True)

This business of joining pipe together in a tight, long-lasting, trouble-free union is a touchy undertaking, as experienced pipeline people and plumbers will tell you. Quality pipe unions are always in demand and that's why a large manufacturer of unions finds his business constantly on the increase.

Some years ago this manufacturer believed it possible to make a union that would minimize failure. They began with good quality steel which was cold formed into the component parts of the union through some 30 intricate operations. Performance tests proved this pipe dream to be the real McCoy. Since the beginning the unions produced by this concern have been considered the most dependable available.

For many years, now, these unions have been fashioned of Sharon Quality Steel Plate, and as this manufacturer says — "to make a quality product, naturally the steel must be the best." So, if you use steel — stainless, coated, high-strength, spring or special — why not take a tip from this leading manufacturer and specify **steels of Sharon Quality.**

A

B

C

Sharon representative knows the job . . . works to help in any way.

(A) Initial blanking combines first draw . . .
(B) Automatic precision threading . . .
(C) Seat becomes integral part of union . . .
Further on seat is machined and polished . .
Threads are cut in automatically . . .

SHARON STEEL CORPORATI
Sharon, Pennsylv

SHARONSTEEL

DISTRICT SALES OFFICES

CHICAGO	INDIANAPOLIS	ROCHESTER
CINCINNATI	LOS ANGELES	SAN FRANCISCO
CLEVELAND	MILWAUKEE	SEATTLE
DAYTON	NEW YORK	MONTREAL, QUE.
DETROIT	PHILADELPHIA	TORONTO, ONT.

How Heat-Treatment Affects Alloy Steels

This is the fourth of a series of advertisements dealing with basic facts about alloy steels. Though much of the information is elementary, we believe it will be of interest to many in this field, including men of broad experience who may find it useful to review fundamentals from time to time.

There are in general five different forms of heat-treatment used with hot-rolled alloy steel. These treatments modify the mechanical properties of the steel to suit the end use. Basically, heat-treating may be defined as an operation or series of operations involving the heating and cooling of steel in the solid state to develop the required properties.

The five forms of treatment mentioned above, as applied to constructional alloy steels, are discussed in the following paragraphs:

(1) QUENCHING AND TEMPERING usually consists of three successive operations: (a) heating the steel above the critical range, so that it approaches a uniform solid solution; (b) hardening the steel by quenching it in oil or water; and (c) tempering the steel by reheating it to a point below the critical range in order to effect the proper combination of strength and ductility.

(2) NORMALIZING is a form of treatment in which the steel is heated to a predetermined temperature above the critical range, after which it is cooled slowly to below that range in still air. The purpose of normalizing is to promote uniformity of structure and to alter mechanical properties.

(3) ANNEALING consists of heating the steel to a point at or near the critical range, then cooling at a predetermined rate. Annealing is used to develop softness in steel, to improve machinability, to reduce stresses, to improve or restore ductility, and to modify other properties.

(4) SPHEROIDIZE-ANNEALING is the prolonged heating of steel at an appropriate temperature, followed by slow cooling to produce a globular condition of the carbide. This treatment produces a structure which may be desirable for machining, cold-forming or cold-drawing, or for the effect it will have on subsequent heat-treatment.

(5) STRESS-RELIEVING is the process of reducing internal stresses by heating the steel to a temperature below the critical range and holding for a time interval sufficient to equalize the temperature throughout the piece. The object of this treatment is to restore the elastic properties of the steel, or to reduce stresses that may have been induced by machining, cold-working, or welding.

Bethlehem metallurgists have had long experience in all methods of heat-treating. They understand the possibilities and limitations of each method with respect to various alloy steels. These men will be glad to give advice or help you with any problems concerning heat-treatment. Always feel free to ask for their services.

And call on Bethlehem, too, for the full range of AISI standard alloy steels, as well as special-analysis steels and all carbon grades. We can meet your needs promptly.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM ALLOY STEELS

BETHLEHEM STEEL

The Iron Age

Vol. 173, No. 22, June 3, 1954

*Starred items are digested at the right.

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Address mail to 100 E. 42 St., N. Y. 17, N. Y.

DIGEST of

NEWS DEVELOPMENTS

WHAT IT COSTS TO BE AN EXECUTIVE — P. 73
There's nothing cushy about being an executive. The money may be good but along with it frequently come ulcers, heart trouble, other psychosomatic ailments. The trouble is a combination of job pressure and the type of personality that makes an executive. Industry and business have a job to do.

STEEL LEADERS ARE SOBERLY OPTIMISTIC — P. 76
Steel industry leaders meeting in New York for the 62nd general meeting of the American Iron and Steel Institute were soberly optimistic about future business conditions. Most agreed that current ingot rates should hold into third quarter, and some see a possible pickup then. Expect labor peace.

CONFUSION ON OUR DEFENSE PLANNING — P. 89
It had seemed obvious and reasonable that we would have to step up our defense spending to counter the Red advances in Asia. Only question was how much. But last week Treasury Secretary Humphrey said Administration still plans to cut government spending $5 billion during fiscal '55.

DEALERS PUTTING HEAT ON AUTOMAKERS — P. 92
As the auto industry faces the newly competitive market, one fact growing more apparent is that dealers are gaining more importance in the overall picture. This may result in substantial changes in the distribution setup. NADA presses for new selling agreements as dealer profits decline.

ADMINISTRATION SEEKS TO AVOID HOT WAR — P. 97
Eisenhower promises no action without Congressional consent. Definitely no troop involvement in near future. Will supply anti-Communist belligerents with material, technical aid. No increase in existing controls over prices, wages, materials will be voted except under wartime conditions.

WESTERN FOIL OUTPUT GETS BIG BOOST — P. 101
Sole western aluminum foil producer, Kaiser Aluminum, is breaking in a new 3000-ton-per-year mill. Regular production slated for later this month. Firm also considering eastern foil mill as market booms for wide range of applications. Can makers are closely watching soda pop developments.

the Week in Metalworking

ENGINEERING & PRODUCTION

NEW METHODS CUT SHELL CASTING COSTS — P. 113
New methods of closing and securing shell molds are rapidly being developed to improve quality of shell mold casting. Dimensional accuracy is more easily maintained and runouts have been reduced. A thermoplastic resin wood glue has been used successfully for rapid closing of shells in a high production setup.

SIMPLE DIE CONTROL SOLVES PROBLEMS — P. 116
In large metal stamping shops, handling and storing tools, dies, and fixtures is a big, often confusing job. Major problems are to store items near the proper machinery; keep obsolete dies from cluttering up storage space. Add numerous daily orders for new, replacement and temporary tooling and problems multiply.

ELECTRIC EYE GUIDES FLAME CUTTING — P. 120
Flame cutting equipment guided by an electric eye can cut all parts of one plate thickness for a weldment in one continuous operation. Inexpensive templates made of black pressed board are outlined with white pressure-sensitive tape. The electric eye follows the line of demarcation between the white and black areas.

COILED STRIP SELECTION AIDS FABRICATION — P. 124
Coiled strip in a variety of materials, finishes, widths and thicknesses permits users to eliminate many processing steps, reduce handling and cut down on floor space requirements. Steel strip for special uses is made to desired hardness, tensile strength, shape, flatness, plastic properties and wear resistance.

MATERIALS ROUNDUP—KEEPS YOU POSTED — P. 152
Tougher competition and increasingly difficult engineering and production requirements have focused attention on the need for new and better materials. Industry has asked for, and is getting, materials that meet many new and higher standards. Today's improved materials can give your product a better start, cut production costs, increase consumer acceptance.

To help you keep tabs on the many new materials being developed for use by industry, THE IRON AGE this week begins a new Materials Roundup section. Here, in brief reports in the first issue of each month, you will find useful information on materials which start with better engineering properties, improved finish, greater workability.

MARKETS & PRICES

MACHINE TOOLS: SOME FIRM, MORE SOFT — P. 79
Early forecasts that '54 would be a good year for machine tool deliveries are borne out in part by new government estimates of first quarter shipments. Overall total lags 1953, but shipments of shaping and forming tools are ahead of last year. Exports and imports continue downtrend.

PURCHASING MEN SEE SECOND HALF PICKUP — P. 80
If purchasing agents are right—and most describe themselves as very cautious optimists—an upturn in the second half of the year is an increasing likelihood. National Assn. of Purchasing Agent's May survey indicates the third monthly increase in a row. The inventory bulge is shrinking.

SALES UPTURN IN VIEW FOR WELDING INDUSTRY—P. 81
Electrode suppliers pace steady sales bulge after slow first quarter start. Consumer inventories are gradually shrinking. Wire mills will be last to feel the upsurge. Welding machine sales fell more in the slump, are slower to come back. Industry sees future promise in new developments.

SCARE BUYING HELPS STEEL ORDERS EDGE UP — P. 171
Steel consumers are stepping up their orders to keep from getting caught with their inventories down in event of a strike. So far this is only a minor part of the market. But it will keep growing until a new wage agreement is reached, or the union strikes. The production rate may edge up in next few weeks.

SEE SIGNS OF FREIGHT CAR BUILDING BOOST—P. 173
A few potential bright spots showed in the steel market this week. One was an inkling of improvement in freight car construction, which has boosted morale of plate and structural suppliers. Grain bin program strengthens galvanized sheets. Strike-hedge buying not large yet. Automakers boost stocks.

KEEP RUNNING TIN SMELTER SAYS COMMITTEE—P. 174
Senate Armed Services Committee has voted unanimously to continue government operation of the Texas City tin smelter for another year. Reason: Threat of being cut off from Malayan tin supplies. The committee also recommends restudy of the adequacy of the present 7-year tin stockpile.

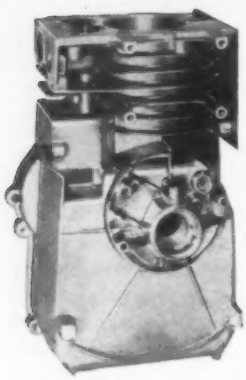
AJAX INDUCTION FURNACES

BRIGGS & STRATTON CORPORATION

1,000,000 INDUSTRIAL ENGINES

4 CYCLE BRIGGS & STRATTON GASOLINE ENGINES

With holding furnaces of 20 kW similar to that in the photo above, and melting furnaces of 100 kW, Briggs & Stratton Corp., Milwaukee, Wisc., is getting increased production under cleaner, more satisfactory working conditions than ever before, *and at lower operating costs.*



The intricate die-cast aluminum cylinder shown at the left is one of many produced at the B & S plant from high grade aluminum alloy melted in low-frequency AJAX induction furnaces. In these furnaces *only the metal is heated.* Energy is transmitted to the molten charge without actual contact through the refractory walls. There are no resistors or other parts having a higher temperature than is absolutely necessary for properly melting the charge. Over-heating is avoided, and there is practically no oxidization.

The holding furnaces next to the die-casting machines as well as the melting furnaces are automatically controlled at a temperature within ±5° F., holding the metal at the lowest feasible casting temperature. The agitation due to internal electrical stirring in the metal gives the best conditions for holding furnaces, and there is little possibility of sludge formation at the bottom, because this is where the heat is generated.

Write for Further Information to

AJAX ENGINEERING CORP., TRENTON 7, N. J.

AJAX
TAMA-WYATT

INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax Wyatt Induction Furnaces for Melting

THE IRON AGE

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ABC Audited Paid Circulation

Society of Business Magazine Editors

BPA Business Publications Audit

NBP National Business Publications

Who Pays for Pensions?

THE word "pension" usually conjures up a sunny beach, a fishing trip on a beautiful lake or that wonderful easy chair feeling which precedes reading a good book, loafing or hobbying.

This will come true for many; for others it will come close to anticipation. Some won't live long enough to do the real thing but they will have had their dreams. Others will find that retiring isn't all it's cracked up to be.

With our expendable raw materials and our large working force we can afford the luxury of liberal pension plans. But there will come a time when those too young to work and those old enough to retire will far outnumber those who must work to foot the bill.

People with their votes and unions with their power are capable of demanding and getting things the future payment of which could tax the imagination. Whether our social security setup is in that class remains to be seen. Perhaps before too many years have elapsed it will be put on a sound actuarial basis.

But what about the noncontributory pension? The employee has no personal responsibility in this plan; he qualifies for payments under certain conditions—usually length of service and age. The federal social security plan at least recognizes the privilege of contribution by the worker and the employer.

The noncontributory pension is looked upon as either a gift or a right wrung from the company by the union. It is neither. Basically this type of pension is unfair. There are about 10 million workers who are covered by such plans. Their cost must come from the selling price of a product or service. That means that 52 million workers who do not benefit help pay the biggest part of the noncontributory pension cost.

The noncontributory pension tends to chain the worker to his job—if he wants to keep this inducement. He can't take his pension with him if he leaves his job or gets fired. Also, companies having a noncontributory plan are reluctant to hire people in their late thirties because it costs too much to fund such a worker's stake in the pension plan.

The more you think about it, noncontributory pension and health plans are undemocratic.

Tom Campbell

Editor

Fork truck with built-in lasso ... for cowboy drivers

● Over-enthusiastic truck jockeys can't hurt Baker Fork Trucks or loads carried (or themselves) by jumping from "low" to "high" or forward to reverse.

Baker drum-type controllers take motor speed in successive steps through acceleration stages, no matter how "heavy" the foot on the accelerator.

Jack-rabbit starts, with resulting motor burnouts, are impossible. Dynamic braking slows truck to a smooth stop, sparing driver and load, and acts as auxiliary brake on steep grades.

Motor strain or jolt from sudden direction changes is prevented by requiring truck to come to a virtual stop before reversing circuit applies.

All this adds up to safer operation for driver, truck and load, less down time, lower repair bills and longer truck life.

For more detailed information on Baker Fork Truck features, write for 4-color sketch book —Bulletin 64. The BAKER-RAULANG Company, 1227 West 80th Street, Cleveland 2, Ohio.

Baker
industrial trucks

Dear Editor:

Letters from readers

Self-Made Man

Sir:

Your editorial of Mar. 18 entitled "The Self-Made Man" was particularly good, I thought. . . .

Let me say that while I am not a regular reader of IRON AGE, I do try to read your editorials for an occasional inspiration to send along to our sales force.

Keep up the good work!

R. C. DOUGLAS
Eureka Williams Co.
Bloomington, Ill.

Hard Facing Process

Sir:

We would be obliged if you would kindly let us know where we can get more details on the new semi-automatic welding and hard facing process mentioned on p. 69 of the May 13 issue.

N. H. POLAKOWSKI
Mgr. of Development
Armzen Co.
Waterbury, Conn.

Further information may be obtained from Howard S. Avery, Research Laboratory, American Brake Shoe Co., Mahwah, N. J.—Ed.

Electronic Brain

Sir:

On the Newsfront page of the May 13 issue there was a paragraph concerning a new electronic "brain" designed to sell in the $30,000 range.

Would you please send me the name of the company which is manufacturing this equipment, together with such information as I may need to identify it.

T. W. RUSSELL, JR.
General Purchasing Agent
American Brake Shoe Co.
New York

Write to Burroughs Adding Machine Co., 219 Fourth Ave., New York, for further details.—Ed.

Zirconium Tubing

Sir:

We were quite interested in the item on the Newsfront page of your Apr. 29 issue wherein you mention the work the British are doing in the field of tube reducing (cold pilger) of zirconium.

Several years ago we did some very successful work in this same field using extruded zirconium hollows with a cross-section which was circular on the outside and inside except for two longitudinal ribs on the interior, which ribs ran the full length of the extruded tube. The ribs were reproduced in proportion in the Rockrite (R) product resulting from our operations.

The results of our work were made available to our English licensee, Tubes Ltd., whom we presume to be the firm referred to in your news comment. We might add that we have been quite successful also in producing cold-reduced titanium, cobalt alloys and uranium 238.

J. D. JUDGE
President
Tube Reducing Corp.
Wallington, N. J.

Scratch Prevention

Sir:

I have just finished reading the article "Want to See Through the Top" by R. D. Raddant in the May 13 issue and enjoyed it very much. Particularly so because it is of interest to me to know that there is a method of preventing scratching, while handling, plastic such as methylmethacrylate, lucite. He mentions that the Ford Motor Co. used Spraylat to spraycoat over the plastic top. . . .

I would appreciate very much getting the specifications of this material from you including the manufacturer so I could investigate further.

T. DeCHERRIE
Asst. Chief Mech. Engr.
Zenith Radio Corp.
Chicago

Spraylat Corp., 1 Park Ave., New York 16, N. Y., will be able to give you more information.—Ed.

New Welding Method

Sir:

On p. 83 of your May 20 issue, could you kindly give us more information on "a new welding process uses a flux-cored electrode . . . "

Also let us know who the manufacturer is and all other pertinent data.

M. ERTMAN
Aetna Sheet Metal Works
East Hartford, Conn.

For more details write to Bernard Welding Equipment Co., 10232 S. Ave. N., Chicago 17, Ill.—Ed.

Short-Cycle Normalizing

Sir:

Would you please send us three sets of tear sheets of the article "Short-Cycle Normalizing Coordinates Tube Mill Production" which appeared in the May 6 issue.

R. W. ELMENTHALER
Liaison Engineer
Surface Combustion Corp.
Toledo

What does "S. B." mean to you?

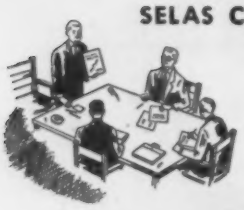
To some, it means Sand Blasting . . . the big blow that gives old buildings that new look. But, to hundreds of industrial designers, it means Small Balls . . . at which Universal is best.

Sure, we make balls from the size of a mustard seed up to that of a walnut, each of them precisioneered for true roundness and silken silence. Write for details.

Universal Ball co.
WILLOW GROVE
MONTGOMERY CO., PA.

ANOTHER EXAMPLE OF

SELAS COOPERATIVE ENGINEERING



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RADIANT PRECISION HEAT HARDENS FASTER ...MORE UNIFORMLY

Rolls hardened to a uniform pattern of hardenability on the rolling surface . . . journals untouched . . . 7 to 12 times faster than ordinary methods. These are the achievements of the new radiant heat roll furnaces designed, developed and built by Selas engineers.

These new Selas radiant heat furnaces accommodate rolls up to 60 inches in diameter with a face of 90 inches. Heat, under temperature program control, is precisely patterned to produce the desired depth of hardness over the roll body . . . with no sacrifice in toughness. Soft spots are eliminated on the roll surface. The shoulders of the roll are unaffected.

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Heat Processing Engineers for Industry • Development • Design • Manufacture

Fatigue Cracks

by William M. Coffey

So Long!

After trying for months to get fired, with no *formal* success, we quit! Solves the whole problem. Funny we didn't think of it before. Easiest way out.

What we're going to tell you about has nothing at all to do with our leaving, but for our last Fatigue Crack it makes a good ending. We received just five minutes ago a pretty good supreme-court-type-piece-of-document which says "DEED AND LAND GRANT Including ALL OIL, GAS and MINERAL RIGHTS" from the "GREAT EMPIRE OF TEXAS."

It's our ticket away from the land of deadlines, puzzles, the editorial "we", corny jokes and sleepless days around the office. From now on we're full of oil and in the market for television stations, hotels, cattle and Hollywood, of which we'll probably buy the whole bloody town of.

You think these things don't happen? Couldn't happen to us? Read on and weep, ole boy! This is my (no more editorial "we" stuff) deed.

Starts right off in real official law talk granting me the General Warranty Deed and Land Grant (No. 2BN TXS S2BNXTC) which bestows upon me "Rights and privileges of Citizenship and Proclaims Me a Titled Texas Property Owner" . . . filed in offices of Sollum Lee Swear, Chat. L. Morgage, Lee Gally, Rea Korded and N. C. Cured —Attorneys and Counsellors Coutlawed, Deepinahart O. Texas.

Then it gets down to business. "EMPIRE OF TEXAS, know all men by these presents: THAT the undersigned (Les E. Holder, Pres. and Dee Possest, V. Pres.,) in consideration of Good Will and a Promise to Brag, Boast and Talk about Texas, receipt of which is hereby acknowledged, has granted, bestowed, conveyed and caused to be placed in hand, to the person of *Tex Coffey* a certain plot or parcel of land from the Magnificent Empire of Texas, of which all territories north to Canada, South to Mexico, East to the Atlantic Ocean and West to and including the Pacific Coast are subdivisions thereof,

It is furthermore hereunto agreed that grantor has granted, sold and conveyed undivided full interest in and to all of the gas, oil, uranium, gold, silver, sulpher and other minerals of every kind in this parcel of land.

TO HAVE AND TO HOLD said real estate hereunto attached, together with all and singular rights and privileges of a property owner and a citizen according to Article 6, Sec. IV of the Land Grabbers Code of The EMPIRE OF TEXAS to wit: That the undersigned (Les E. Holder, Pres., and Dee Possest, V. Pres.) does hereby bind itself, its successors and assigns to warrant and forever defend the above proclaimed citizen (*Tex Coffey*) and land holder (*same*), his heirs and assigns the right and privilege of going thru red lights, parking in fire zones, borrowing from neighbors, disturbing the peace after midnight by radio, auto, rebel yells and fire arms, and bragging loud and long about the glories of the wealthy, exciting, and ever-expanding Empire of Texas . . .

IN WITNESS WHEREOF, the undersigned (Les E. Holder, Pres. and Dee Possest, V. Pres.) has caused this instrument to be executed by hanging. ATTEST: M. Bezzel, Secretary. SUBSCRIBED AND SWORN TO before me, a Notorious Public Nuisance, in and around Bumstear County when the Sheriff is away—C. Ewin Jale."

So long.

Puzzlers

The race track puzzler? Why, simple. Don't believe us, just ask the winners who said 479.146978 feet. They are: Nora LaDow, Birmingham, L. G. Bayrer, The Atwater Manufacturing Company, Plantsville, Conn., Charlsie, Group Secretary for the IRON AGE puzzle club of General Steel Castings Corp., Granite City, Ill. (Charlsie says Dale Letterman burned the midnight oil—that word again—on this one) Joe White of Delco-Remy Division, GM, Anderson, Indiana.

New Puzzler

Here's one for the flagpole sitters, flag of Texas, that is. Three flagpoles 60, 80, and 100 ft. tall are erected at the three corners of a triangular field, 100 ft. on each side. A ladder is placed at a point in the field so that it can be leaned to the exact top of each of the three flagpoles without changing the location of the base of the ladder. How long must the ladder be and where should the base be located?

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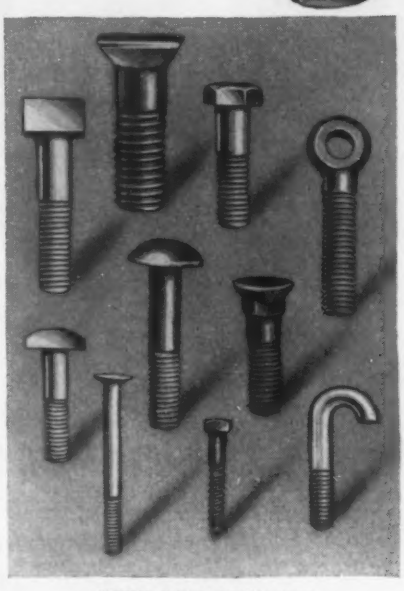
TEE BOLTS
by an
exclusive method

Among Pawtucket's many specialty products are these lower-cost tee-head bolts. Pawtucket's exclusive production method keeps cost low, dimensional accuracy unusually high and strength above standard.
Pawtucket tee head bolts are made in standard sizes ¼" and larger, or to your specifications. In any size, you can depend on a uniform Class 3 fit, if required.

All standard steels, stainless steels and non-ferrous metals, including Titanium



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B.F.Goodrich

Acid bath gives irons shiny faces

Koroseal is a typical B.F.Goodrich product development

ELECTRIC irons wear a thin coat of chrome for protection, but what gives them real shine and permanence is the bright nickel beneath. The irons take their nickel bath in big tanks like the one in the picture. But the process used to be a headache.

The plating solution is so strong it would eat through wood and metal tanks. Leaks, danger to workers, constant repairs, expense were the result.

Then a sales engineer told the appliance maker about Koroseal, the flexible material developed by B. F. Goodrich, that stands practically all acids. A Koroseal lining was tried here, and is still working perfectly after seven years. No leaks, no repairs, no delays in production. Today, Koroseal is used in hundreds of places in industry, for "impossible" jobs that other materials can't touch.

Koroseal flexible material is only one example of the product development and improvement that is always going on at B. F. Goodrich. Every product B. F. Goodrich makes—V belts, conveyor belts, hose and many other things—is constantly being studied by practical engineers to see how it can be improved from the user's standpoint, how it can be made to last longer and do a better job. To take full advantage of B. F. Goodrich practical research, call your BFG distributor, or write *The B. F. Goodrich Company, Dept. M-223, Akron 18, Ohio.*

Koroseal—T. M. Reg. U. S. Pat. Off.

B.F.Goodrich
INDUSTRIAL PRODUCTS DIVISION

Dates to Remember

Meetings

JUNE

AUTOMOBILE MANUFACTURERS ASSN.—Annual meeting, June, Detroit. Association headquarters are at 320 New Center Bldg., Detroit.

AMERICAN GEAR MANUFACTURERS ASSN.—Annual meeting, June 6-9. The Homestead, Hot Springs, Va. Association headquarters are at Empire Bldg., Pittsburgh.

NATIONAL METAL TRADES ASSN.—Annual Western plant management conference, June 6-12. Association headquarters are at 122 S. Michigan Ave., Chicago.

EXPOSITIONS

ASSN. OF IRON & STEEL ENGINEERS—Annual convention with Iron & Steel Exposition, Sept. 28-Oct. 1, Public Auditorium, Cleveland. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

AMERICAN SOCIETY FOR METALS—National Metal Exposition, national metal congress, Nov. 1-5, Palmer House, Chicago. Society headquarters are at 7301 Euclid Ave., Cleveland.

SOCIETY OF AUTOMOTIVE ENGINEERS—Summer meeting, June 6-11, The Ambassador and Ritz-Carlton Hotels, Atlantic City, N. J. Society headquarters are at 29 W. 39th St., New York.

AMERICAN FOUNDRYMEN'S SOCIETY—Annual meeting, June 7, Chicago. Society headquarters are at 616 S. Michigan Ave., Chicago.

THE INSTITUTE OF COOKING & HEATING APPLIANCE MANUFACTURERS—Annual meeting, June 7-9, Netherland Plaza Hotel, Cincinnati. Institute headquarters are at The Shoreham Hotel, Washington, D. C.

AMERICAN SOCIETY FOR QUALITY CONTROL—Annual convention, June 9-11, Jefferson Hotel, St. Louis, Mo. Society headquarters are at Room 5036, 70 E. 42nd St., New York.

CUTTING TOOL MANUFACTURERS ASSN.—Summer meeting, June 11. Association headquarters are at 416 Penobscot Bldg., Detroit.

MAGNESIUM ASSN.—Summer meeting, June 9-12, Seigniory Club, Quebec. Association headquarters are at 122 E. 42nd St., New York.

AMERICAN BOILER MANUFACTURERS ASSN. & AFFILIATED INDUSTRIES—Annual meeting, June 13-16, The Homestead, Hot Springs, Va. Association headquarters are at 1571 W. 117th St., Cleveland.

AMERICAN SOCIETY FOR TESTING MATERIALS—Annual meeting, June 13-18, exhibit of testing apparatus and laboratory supplies and photographic exhibit, Hotels Sherman and Morrison, Chicago. Society headquarters are at 1916 Race St., Philadelphia.

COMPRESSED GAS ASSN., INC.—Summer meeting, June 14-16, Seaview Country Club, Absecon, N. J. Association headquarters are at 11 W. 42nd St., New York.

RADIO - ELECTRONICS - TELEVISION MANUFACTURERS ASSN.—Annual convention, June 15-17, Palmer House, Chicago. Association headquarters are at 777-14th St., N.W., Washington.

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS — Semi-annual meeting, June 20-24, William Penn Hotel, Pittsburgh. Society headquarters are at 29 W. 39th St., New York.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS—Summer and Pacific General Meeting, June 21-25, Los Angeles. Institute headquarters are at 33 W. 39th St., New York.

CASTER & FLOOR TRUCK MANUFACTURERS ASSN. — Summer meeting, June 23-25. Association headquarters are at 27 E. Monroe St., Chicago.

AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS—Semiannual meeting, June 28-30, New Ocean House, Swampscott, Mass. Society headquarters are at 62 Worth St., New York.

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Centrifugal castings are superior castings. The metal is sounder, finer-grained, more uniform. It is free of gas pockets, blow holes and other defects often difficult to keep out of static castings. Tensile strength is close to that of rolled or hot-forged alloy steel. Dimensions are accurate, usually requiring less machining and finishing and thus speeding production.

If you require *extra* qualities in your high alloy pipe, investigate DURASPUN Centrifugally Cast Pipe. We can produce it in OD ranging from 2½" to 24" and in lengths up to 15' according to diameter. Our experience in the field of centrifugal high alloy castings dates back to 1931. Our experience in the field of static high alloy casting goes back to 1922. We can give you good service.

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the Iron Age
FOUNDED 1855

THE IRON AGE Newsfront

ANOTHER NEW APPLICATION FOR ULTRASONICS has been found in production of germanium for transistors. Pure germanium bouls are grown on an ultrasonically vibrated fixture inserted into a molten germanium bath. Method is said to permit faster growth, yield better electrical characteristics.

INCREASED AUTO INDUSTRY DEMAND FOR WIDE SHEETS is expected late this year. The 1955 stylings of several models indicate stampings for specific parts such as hoods require a wider sheet width than formerly used.

UP-GRADING OF LINE EMPLOYEES who have taken homestudy courses is becoming more common in industry. Growing recognition of management's attitude toward self improvement has had a profound affect on home study statistics. Recent estimates indicate some 2 million Americans spend $40 million a year for special training.

DEVELOPMENT OF HYDRAULIC PRESSES FOR POWDERED METAL PARTS is getting more attention from press builders, particularly for use where deeper fills are required. Slower action of these presses is said to give air more time to escape and thus reduce laminations on deeper fill parts.

LOOK FOR MORE BUILT-IN GAGING on new machine tool models. Several builders are reported planning to incorporate devices which will shut off machines if parts exceed tolerance limits. In some cases these built-in units will also adjust tools to remain within tolerances.

A NEW PLASTIC TOW TARGET is scheduled for final flight tests. The target will be used to train crews of Army Skysweeper antiaircraft guns. Produced by an aircraft builder, this recoverable item is designed to be towed at supersonic speeds at altitudes to 8 miles.

GOOD PROSPECTS FOR ELIMINATING DRIVER ERROR in car operation are seen by the automotive industry. One industry spokesman says automatic driving is possible now, but the apparatus required would be costly and unwieldy.

A NEW HIGH STRENGTH POLYESTER FILM with an unusual combination of properties will soon be available in large scale quantities. It offers: Tensile strength of 23,500 psi, very high dielectric properties, chemical inertness, very high impact strength and retention of properties from -60° to 150° C.

CONTROLLED ADDITION OF SULFUR TO HIGH SPEED TOOL STEELS is reported to improve machinability and extend tool life. The improved material could strengthen position of high speed steel against further inroads by carbides. Equally encouraging results are claimed with high carbon and high chrome die steels.

FOR BEST MECHANICAL PROPERTIES machined beryllium should be annealed and the disturbed surface metal removed by etching, a recent study indicates.

Cross-section shows water-tight terminal box and protected leads.

Thermo-setting compound and ECAMICA boards . . . two EC&M developments for welded magnets.

Ribbed manganese bottom plate and solid pole shoes on under side of Type SW magnets.

Lift more for less!

...WITH EC & M LIFTING MAGNETS

EC&M Type SW *all-welded* lifting magnets have a wider and more efficient magnetic path which guarantees high output . . . what's more, they maintain it! Here's a magnet that has no bolts to stretch and cause load-limiting air gaps at the poles. Welding of both inner and outer shoes keeps the fit snug. Coil space is better proportioned because recesses for bolts are not required. On the bottom, too, inner and outer pole shoes have no cored holes for bolt heads . . . they're of solid construction and offer greater resistance to wear.

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Send for 24-page Bulletin 900 showing magnets at work.

The Iron Age
FOUNDED 1855
News Section

EXECUTIVES: Face Special Health Hazards

Responsibility, mental pressure, constant need to make decisions often result in physical ailments . . . Executive personality a factor—By *Dr. T. A. March.*

There's nothing cushy about being an executive. Maybe the money's good, perhaps you have a rug in your office, but along with the responsibilities of being an executive frequently come ulcers, heart trouble, high blood pressure and other physical ailments.

Often these physical ills result from mental disturbances that can be traced directly to your job. You might not have them or be due to get them if you were a riveter, mechanic, machine tool operator.

It's responsibility, mental pressure, constant need to make decisions and compromises that single you out as a potential victim of psychosomatic illnesses.

And this problem is due to get worse. Each year as business management becomes more complex, more is demanded of an executive. He not only has his own company to think about, he has problems involving stockholders, labor unions, the government, and the public.

What Makes an Executive

Management has done much in recent years to lessen physical hazards for employees and is also showing an interest in improving their emotional stability, realizing that there's a link between a high production and good mental health. But so far mental welfare of executives has been largely overlooked.

Part of the problem of psychosomatic disturbances in executives is the personality and character traits that frequently make a man a leader.

Mental adjustments and personality development begin in early childhood (some authorities claim they start even before birth). When a child wants to do something his parents oppose he has to make a compromise or face punishment. The process of being frustrated and forced to compromise continues throughout a person's life, and the resulting emotional conflicts give rise to fear, anger, guilt.

The impact is both mental and physical, often resulting in stepped up heart beat, increased blood pressure, cold, clammy skin.

What Can Happen to You

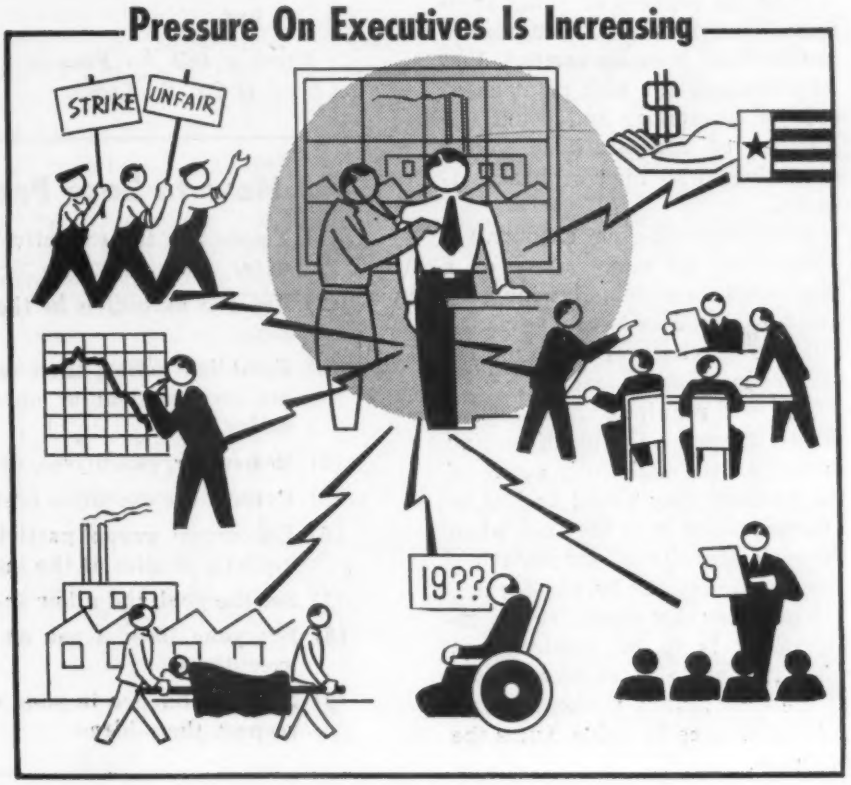
As a person grows older he automatically hits upon substitutes to try to keep himself happy in spite of the compromises he is forced to make. For the "Compulsive Personality," found frequently in the executive class, these substitutions often take the form of overconscientiousness, an infinite capacity for work, and industrious attitude, a desire for perfection, a rigid code of self-discipline.

These qualities may make a man a topflight executive, but they may also take their toll on the body, showing up as stomach ulcers, pains in the chest, shortness of breath, high blood pressure, heart failure, even asthma, pains in the muscles and joints similar to arthritis, and intractable skin eruptions.

All these ailments only add to the executive's anxiety, increase his fear of the future, make it even more difficult for him to obtain his goals.

Turn Page

Pressure On Executives Is Increasing



Dr. Thomas A. March, author of this article, has been a psychiatrist for a state mental hospital and was chief of a neuro-physchiatric division unit while serving as a major in the Air Force. After the war he was assistant chief of the Psychiatry and Neurology Div., Veterans Administration, in Washington, D. C., and is now chief of a neuro-psychiatric division for the VA in Pittsburgh.

Another common executive type is the "Cyclothymic Personality." He's the back-slapping salesman, the hail-fellow-well-met executive.

On the surface he seems rather superficial, but he's capable of profound thought. Nothing seems to bother him but nevertheless he experiences the same emotional conflicts as the "compulsive" executive.

Most executives fall somewhere in between these two personality types, leaning slightly more to one side or the other.

It Can Kill You

That the process of being frustrated and forced to compromise can be fatal is easily verified. Just look through the obit columns of today's newspaper and count the number of comparatively young executives who died of heart attacks.

Naturally, not every executive is headed for an early grave or a psychiatrist's couch. But industry and business does have a responsibility to do whatever it can to ease the pressure on its leaders.

This will require a change in attitude, however. If business and industry were made fully aware of the problem they would be just as alarmed about it as they are when there's a scarcity of raw materials or when a machine breaks down.

Remember that executive accomplishment is to be admired but when it is made at too great a cost to the individual's prolonged usefulness it loses its value, hurts the business.

You, Too, Can Join the Coronary Club

Though it's crowded, membership in the Coronary Club is unrestricted. Probably many of your best friends belong, but you won't have to use them as references. All you have to do is remember:

(1) Your job comes first; personal considerations are secondary.

(2) Go to the office evenings, Saturdays, Sundays and holidays.

(3) Take the brief case home on the evenings when you don't work late at the office. This provides an opportunity to review completely all the troubles and worries of the day.

(4) Never say no to a request.

(5) Accept all invitations to meetings, banquets, committees, etc.

(6) Do not eat a restful relaxing meal—always plan a conference for the lunch hour.

(7) Fishing and hunting are a waste of time and money—you never bring back enough fish or game to justify the expense. Golf, bowling, pool, billiards, cards and gardening are also a waste of time.

(8) It's a poor policy to take all the vacation time provided for you.

(9) Never delegate responsibility to others—carry the entire load at all times.

(10) If your work calls for traveling, work all day and drive all night to make your appointment for the next morning.

From a talk by Francis J. Curtis, vice-president, Monsanto Chemical Co., St. Louis.

How to Ease Pressure on Executives

(1) Emphasize the executive's contributions—don't just evaluate.

(2) Put the executive in the driver's seat, but give him the keys.

(3) Establish policy, then encourage the executive to set up his own method of operation within the limits of that policy.

(4) Remember, executives, too, are human.

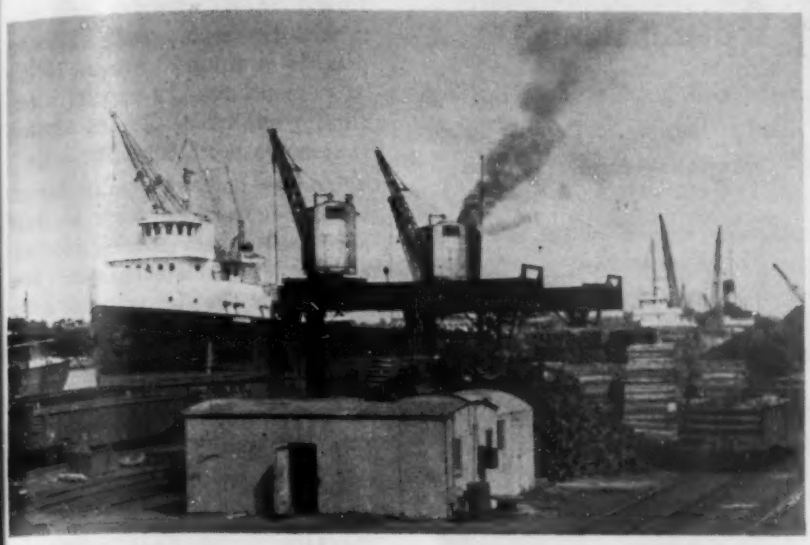
(5) Respect the executive first; his position, second.

(6) Encourage group participation, group planning, psychoanalytic studies of the individual, healthful recreation.

(7) Set the goal and allow the executive to blaze the trail.

(8) Everyone likes a pat on the back for a good job—even executives.

(9) Have confidence in your executives, trust their judgment, respect their ideas.



SCRAP shipments on the Great Lakes from Detroit have been slow so far in '54. Most active area is Detroit's Nicholson Dock where Nicholson Transit Co. has four scrap carriers available.

SCRAP: Detroit Lakes Shipments Dip

Spring bundles, turnings movement to blast furnaces under usual levels . . . See June pickup . . . But '54 won't equal past years . . . Chicago buying rises—By *R. D. Raddant.*

When a Detroit scrap man talks about "laying it down on the dock," everyone knows he means the Nicholson Terminal Dock Co. at Ecorse in Detroit's downriver area.

The dock and its sister company, Nicholson Transit Co., are the biggest handlers and shippers on the Great Lakes of scrap, an important by-product of Detroit's nearby automaking and related industries.

Spring Shipments Low

Much of Detroit's surplus of bundles and turnings is stored on the dock during winter months awaiting spring. Then it is transported by Nicholson's four ships outfitted for scrap handling to consuming areas on the Lakes.

But this year the Nicholson Dock has lagged behind in scrap shipments. Shipping was late to get started and the depressed market had a disastrous effect.

By May 20 of 1953, more than 300,000 tons of scrap had moved out of Detroit from the dock compared with only 10,500 tons by the same date this year.

But supported by heavy buying in Chicago in recent months and the encouraging advancement of the steel ingot rate, scrap shipments are expected to pick up in June and a fair year of total scrap handling is expected.

Bring Back Pig

In 1953, a total of 180,000 tons of scrap moved off the dock, compared with 120,000 tons in 1952 and only 96,000 in 1951. Nicholson officials will be surprised if 140,000 tons move this year.

Where does it go? Mostly to Buffalo, Cleveland and Chicago, although cargoes of turnings have gone to smaller industrial areas, such as Duluth, where blast furnaces are in operation.

Often a Nicholson ship will leave Detroit with a load of scrap, for Buffalo, for example, and return with a load of pig iron for Detroit foundries, a natural exchange since Detroit has no blast furnaces supplying pig commercially. Frequently the return load is steel. In fact, the Nicholson company was founded as a steel, pig and scrap handler. Little, if any, general cargo is handled at the dock.

Turnings to Buffalo

Not all scrap and steel moved on the Lakes is handled by Nicholson, of course. The Ford Motor Co.-Bethlehem Steel customer relationship is responsible for a lot of movement by captive ships of these corporations. U. S. Steel also moves scrap and steel on its carriers. Independent shippers figure to some extent.

Scrap shipped from Detroit on the Lakes is divided about equally between bundles and turnings. Almost all of the turnings go to Buffalo blast furnaces.

This year in particular, a lot of scrap will go by the Lakes to Chicago. The strong scrap market there was responsible for more than usually heavy purchases of automotive scrap by Chicago brokers.

But there is a sad side to this phase too. Because of the recent reduction in railroad rates, steel companies are less likely to ship steel to Detroit on the water. As a result, there is little return cargo from Gary to Indiana Harbor.

Water rates for scrap shipment are $1.55 per gross ton from Detroit to Cleveland, $1.75 to Buffalo, and $2.30 to Chicago. Dock handling results in a cumulative total of about $1.25 at Detroit. Presumably, handling charges at the destination are low as delivery would be to the consuming mill's own docks.

STEEL: Leaders Soberly Optimstic

AISI delegates predict ingot rate will hold steady through third quarter . . . Some see pickup then . . . Expect labor peace . . . Speakers stress public relations—By G. G. Carr.

Business optimism tempered with caution and a sober realization of the responsibilities of a basic American industry hallmarked the 62nd general meeting of American Iron and Steel Institute in New York last week.

Industry leaders confirmed that steel demand had picked up moderately in the past few weeks.

Consensus was that production would hold at current levels until third quarter at least. Opinion varied somewhat on the possibility of an increase in the fall, with both U. S. Steel's Benjamin Fairless and Bethlehem's Eugene Grace going on record as expecting little if any improvement at that time. Mr. Grace added that he would be content if his company's operating rate holds at its current 72 pct through the third period.

National Steel's Ernest T. Weir, however, was slightly more optimistic. He admitted the possibility of a slight increase in third quarter, since he believes consumers' inventories will need replenishing by then.

J. L. Mauthe, president of Youngstown Sheet & Tube, said his company is currently operating at 72.5 pct of capacity. He expects to hold this rate through second quarter, but warned of vacation periods, warm weather and possible changes in automotive steel buying because of model changes thereafter.

Jones & Laughlin's chairman, Ben Moreell, also foresaw a steady-as-she-goes course for his firm through the second period. J&L is currently running at 73 pct of capacity, up from April's 67 pct.

And Edward L. Ryerson, chairman of the executive committee of Inland Steel, was definitely optimistic. He reported that his company is running at around 100 pct at present, and he expects a continuing high rate. But he admitted that some decline was probable.

Union demands and current wage negotiations were naturally a major subject for corridor discussion. The steelmasters were unanimous that an amicable settlement would be reached. All agreed that a steel strike would be, in Mr. Fairless' phrase, "a colossal error."

Would Raise Prices

But several company heads warned that even a moderate wage increase would mean a price increase. And Mr. Grace indicated that he felt steel demand was strong enough to absorb at least a moderate price rise.

Opinion on the scope of United Steelworker demands was probably summed up for all present by Republic Steel's Charles White. Mr. White said bluntly: "I think the steelworkers must be kidding."

Need for a continuing strong public relations program for the steel industry was stressed by Mr. Ryerson. The Inland head pointed out that:

"We are on trial today with a government leadership that has pledged itself to maintain a sound and free economy. The need of our help to guarantee its continued existence is another reason for our enthusiastic support of a joint cooperative effort to maintain a favorable public opinion."

Reaching the Public

Mr. Ryerson added that the industry's public relations are greatly improved over what they were, but pointed out that much of the general public still imagines the steel industry as being powered by long hours of hard physical labor—"in spite of the fact that under existing conditions perhaps 95 pct of all operations are completely mechanized and labor has advanced to such a high degree of skill that its principal function is control by management of machines—calling for brain in place of muscle."

WINNER of the American Iron and Steel Institute award is William C. Bell, of Stewarts & Lloyds, Ltd. Presentation by Max D. Howell of AISI.

And U. S. Steel president Clifford Hood warned that a fabulous new era for the American steel industry is more than possible, but only if the profit system wins its present war for survival.

Recent advances in science and technology, Mr. Hood said, indicate the steel industry may still be in its infancy. But management and capital must be allowed to develop these advances. Steelmakers must prove that they can meet the challenge. "We have allowed others to speak for us too often in matters vital to the successful performance of our jobs," he added.

Stresses Employee Relations

Mr. Hood stressed employee relations as a vital part of this job. "It has long been a personal belief of mine," he said, "that in any competitive industry, that company will be most successful which takes positive action to instill in the minds of its employees such elements as self-reliance, optimism, interest and a high regard for their respective responsibilities."

Don't Forget Stockholders

Financial obligations of the industry were spotlighted by Ernest T. Weir, chairman of National Steel Corp. He pointed out that the earnings record of steel is not bright, and admitted frankly that the investing public looks on steel stocks with misgivings and distrust.

Earnings Too Low

Mr. Weir cited a National City Bank of New York study showing that in the 26-year period from 1928 to 1953, steel industry earnings were below the average of all manufacturing industry every year. And in half those years, according to the study, steel was never better than sixth place from bottom.

The industry must reflect in its prices the true cost of producing steel, Mr. Weir maintained. This cost includes cost of providing and maintaining all steelmaking facilities, not just the part of those facilities needed when industry operations are below capacity.

Automation was hailed as prob-

AUTOMATION has enormous possibilities in the steel industry, said Mervin J. Kelly, (right) president, Bell Telephone Laboratories in Schwab Memorial Lecture. He is shown chatting with Max D. Howell, executive vice-president, AISI.

LEADERS Ben Fairless, chairman of U. S. Steel, and Gene Grace, chairman of Bethlehem talk shop during the AISI meetings in New York. Both expect little upturn in steel business this fall. Mr. Grace said he would be satisfied if Bethlehem holds its 72 pct operating rate through third quarter. Some other steelmen were more optimistic.

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ably this century's greatest contribution to the reduction of man's burden by Dr. M. J. Kelly, president of Bell Telephone Laboratories, in the annual Schwab Memorial Lecture.

Dr. Kelly said that "automation through electronic digital systems will relieve man from the more routine and repetitive mental operations of the civilian economy . . . The completely automatic factory can, indeed, be foreseen."

Awards Granted

William Charles Bell of Stewarts & Lloyds, Ltd., Great Britain, received the institute's medal for his paper "European Operating & Technical Practices." He is the first person from outside the United States to receive the award.

A second award of the medal was made to W. A. Black, chief electrical experimental engineer, Steel & Tubes Div., Republic Steel Corp., for his paper, "Ultrasonic Testing of A Large Crankshaft."

Stress corrosion resulting from subjecting stressed stainless to chemicals for which they are not intended was the subject of a paper by R. A. Lincoln, chief metallurgist, Allegheny Ludlum Steel Corp.

Behavior of high tensile wire in prestressed concrete construction was analyzed by Walter O. Everling, director of research, American Steel & Wire Div. of U. S. Steel.

H. C. Smith, vice-president, quality and research, Great Lakes Steel, described quality control techniques used in making cold-rolled sheet.

Gary Medal to Hoyt

Elton Hoyt, 2nd, 66-year-old senior partner in Pickands Mather & Co., was awarded the Institute's Gary Memorial Medal in a surprise ceremony at the annual dinner, May 27. The award has been made only 12 times since it was instituted in 1927 and this is the first time an ore man has received it.

B. F. Fairless made the award for the Institute in recognition of Mr. Hoyt's "distinguished service to his country, the steel industry and the free world" in peacetime and during two world wars.

TOOLS: Some Firm, More Soft

First quarter figures on machine tool shipments, orders, show most lagging 1953 . . . Shipments of forming, shaping tools top last year's . . . Total deliveries are down.

Early forecasts that 1954 would be a good year for deliveries of U. S.-made made machine tools are borne out in part by new government estimates of shipments during the first quarter.

Statistics compiled by Business & Defense Services Administration show a somewhat slower start on deliveries this year than last. But they also indicate some signs the industry is stronger than in 1953.

Shipments of forming and shaping tools, in the January-March period, for example, were slightly ahead of same time last year, averaging about $22.5 million per month. And for March shipments hit $23.2 million.

Less Than Last Year

However, over-all metalworking machinery deliveries in the opening quarter, as reported to BDSA by 258 firms handling 95 pct of all shipments, amounted to $328.3 million. In the same months last year, the total was $380.3 million.

Included in the latest estimate were $290.9 million of cutting-type machine tools and $67.4 million of the forming and shaping types.

Last year, shipments consisted of $315.3 million of the cutting type and $65 million, forming and shaping types.

Have 10-Month Backlog

Cutting tools were shipped at the average rate of about $87 million worth each month in the January-March period. This was an appreciable decline from the monthly average of $105 million in the initial quarter last year.

New orders for cutting tools in first quarter '54 averaged $45 million per month, as compared with an $83 million average for first quarter 1953. Unfilled orders on Mar. 31 reflected a 5-month backlog.

Predominant among shipments of forming and shaping tools were mechanical presses and hydraulic and pneumatic presses. These accounted for more than half of all shipments in this class. Forging machinery and hammers were next in importance.

New orders for tools in this category in the first quarter averaged $15.6 million per month. In the same months of 1953, the average was $23 million.

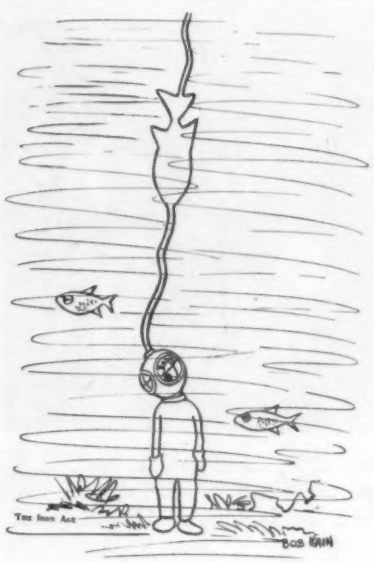
Unfilled orders, valued at $226.5 million at the end of March, amounted to a 10-month backlog.

Exports-Imports Down

Statistics on machine tool exports in January and February show a smaller total than in the first 2 months of 1953. The comparative figures were $21.6 million this year, $31.7 million in 1953.

But forming and shaping tool exports added up to $7.9 million this year, while in the comparable months last year the total was only $6.6 million. Canada was the largest single market for forming, shaping and cutting tools.

Trend of U. S. imports of foreign-made tools continues down. Imports in January and February were valued at $4.1 million, while in the same months last year they amounted to $6.7 million.



Switzerland and West Germany provided about 65 pct of the tools brought into this country in the first 2 months of the year.

Porcelain Enamel:

Industry optimistic on appliances at PEI meeting.

"It's a fact that we Americans are now spending approximately $15 billion each year on home goods. Of this figure, almost $3 billion is spent for appliances, with about 40 pct of that figure being for the purchases of refrigerators and washing machines."

That's part of the reason for optimism, W. H. Lowry cited in speaking at the recent Porcelain Enamel Institute meeting in Chicago. He added that, while sales of these two appliances may decline, there is a trend toward more automatic equipment in the home. This means healthy conditions for porcelain enameling.

Other reasons for optimism were noted by other speakers. Glenn A. Hutt, vice-president of Ferro Corp., mentioned the population growth, expected reversal between 1956 and 1960 of the present decline in family formations, increase of national income and gross national product, and greater consumption of electric power.

Mr. Hutt also stressed the advantages of a porcelain enamel finish for home appliances.

Rutcher Skagerberg, of Public Housing Administration, indicated that more porcelain enameled products could probably be used in government housing projects.

In making a 7-year forecast, F. C. Woleslagle, U. S. Steel Corp., predicted the likelihood that porcelain enamel production will accumulate to over $2.75 billion during that period. He outlined 1953 construction expenditures, indicating the "terrific possibilities for porcelain enamel" in this vast market.

BUYERS: See Second Half Pickup

Purchasing agents say business is picking up, will get stronger . . . Steel consumption reported 15 pct above production . . . Describe new products—By K. W. Bennett.

If purchasing men are right—and most describe themselves as very cautious optimists—an upturn in second half 1954 is an increasing likelihood.

While on-the-spot questioning didn't elicit reports of a free-wheeling upsurge, visitors at the National Association of Purchasing Agents convention at Chicago last week were talking about a gentle, steady business upturn. The association reported the uptrend was in its third month in their May survey and said new order volume has been increasing since February.

No Scare Buying

As a conference speaker described business trends, 1953 and 1954 have horse race characteristics. Last year business got away to a fast start and then faded. This year there was a bad start but it looked like business would be gathering speed when it moved into the final quarter mile.

The sales upturn hasn't boosted purchasing of raw materials, indicating that inventories of unfinished goods are still being pared.

A steel warehouseman reported that in the past month his warehouse has sold twice as much steel as it has purchased. And buyers of farm equipment, steel strapping, containers, small tools, and appliances, agreed that they are still pegging their buying well below outgoing sales, though they are positive their present sales uptrend will continue at least through June and into the vacation season.

The Indo-China war scare, possibility of a steel strike, have had almost no effect on raw materials buying to date. The sole exception: consumers of some wire grades. This is particularly true in the Midwest, where buyers find merchant wire products are in strong demand.

Pipe Skelp Goes Soft

But the fiscal horizon does have a few gray spots. Plate production capacity, criticized by some carbon plate buyers as inadequate for emergency production as late as 1953, was questioned by purchasing agents attending the NAPA steel forum.

NEW PRESIDENT of National Assn. of Purchasing Agents is G. W. Howard Ahl of Phillip Morris & Co., Ltd.

One PA proposed from the floor: "Why not raise the price of plate? Wouldn't that encourage construction of plate mills?" The answer: plate capacity increases aren't encouraged by present market forecasts. Increases in ingot capacity during 1952 and 1953 will provide more ingot for plate rollings in an emergency, and hot strip mills can provide additional rolling space.

Another soft spot was indicated by comments that there has already been a drop in demand for pipe skelp used in heavy oil lines. This trend is expected to continue.

Buy Less More Often

For steel generally: Republic Steel, which previously expected a 30-month dip in steel production has been forced to revise its estimate to a 15-month dip (beginning in July of last year), and foresees an increase in the fall. It was also estimated that steel is presently being consumed at a rate 10 to 15 pct higher than the rate at which it is being produced.

Reinforcing this statement by L. S. Hamaker, Republic Steel Corp., was the statement of C. L. Hardy, Joseph T. Ryerson & Son, that the steel warehouses last year

NAPA EXECUTIVE COMMITTEE; first row, l. to r., Henry L. Ruf, E. F. Andrews, G. W. Howard Ahl, H. E. Kaiser, Donald R. Coultrip; back row, l. to r., Carl A. Toothill, A. L. Francis, Fred G. Syburg, E. O. Haymond, Walter G. Joyce, Frank E. Whyte.

consumed 19.2 pct of the steel produced by the mills and that consumption during first quarter 1954 dropped slightly to 18.2 pct.

On the other hand, the average warehouse order has fallen from 1800 lb in the peak Korean periods to 1200 lb in 1953 and is now down to about 1000 lb.

Lower tonnages per order with a higher order volume is the explanation. The tonnage customer is relying on mill steel while the small tonnage customer has rediscovered the advantages of small quantity purchases when made at the warehouse level. Purchasing agents for large concerns who have small inventory gaps to fill are also using warehouse stocks.

What Was New

A new development at the NAPA show, and one that can be expected to attract considerable attention from appliance producers within the next few months, is roll bonded piping, a kind of printed metal circuit produced from sheet. It was displayed by Western Brass Mills, Div. of Olin Industries.

These one-piece piping layouts are produced by "painting" a tubing diagram on a stainless steel or aluminum plate, laying another plate of the same metal on top of it and running both between rollers.

The plates are roll-welded together, except where the diagram is painted on the lower plate. The bonded sheet is then inflated hydraulically, forming a perfectly bonded tubing that is expected to find uses in refrigerators, aircraft.

Another interesting development was a copper-lead hammer that combines the softness of lead with the longer life of copper. Automotive buyers are interested, and one prospect who was planning to make up his own lead hammer thinks this may be the answer.

There was also a tapemaker displayed that produces pressure sensitive tape at the point of use and stretches 5 gal of adhesive over 3 miles of tape.

WELDING: Sales Upcurve In Sight

Electrode suppliers spark increasing business . . . Mills lag behind . . . Inventory bulge shrinking . . . Machine sales off . . . New developments promised—By *K. W. Bennett.*

After a slow start in 1954, welding sales were still moving up last week. Electrode suppliers, who've been reporting increases over the past 60 days, were placing more faith in the longevity of the sales bulge. Producers of machines and accessories were in agreement. By last week, scattered reports of "better business" from the welding industry were becoming widespread.

Mills supplying wire and rod to electrode producers haven't yet noted any upsurge in shipments. Wire products, particularly in the Midwest, have been moving up through the spring. Rod and wire for welding applications continues to lag.

Pass Inventory's Peak

The answer was the nightmare that has dogged most steel producers through first quarter: high inventories. Said one electrode supplier, "Last spring our customers were frankly worried about an electrode shortage. They squirreled-away electrode in locked rooms. Why, I believe some of them had as much electrode in stock as we normally carry."

And the inventory in consumers hands seemed to move out slowly. A few consumers of steel, including plates, shapes, bars, and sheet, were developing inventory shortages as early as March, welding salesmen waited out a customer inventory reduction that is, only beginning to be felt.

Machine Sales Down

Welding had been hit, like other industry, hard in second half 1953. As indicated by electrode sales, rapidly dropping orders from such heavy electrode users as military tank, ship, and railroad builders, forced the electrode seller into a market that did less welding per job, required less electrode per weld. As one equipment producer told THE IRON AGE, "We believed the entire transportation industry, and in that I include railroad, construction equipment, and farm equipment, was due for a skid. We'll admit some of our customers in those fields aren't buying at even normal levels yet—but our own overall sales volume is good and getting better."

Turn Page

Welding Electrode Shipments in Pounds

National Electrical Manufacturers Assn.

		1953		1954	
1941	377,564,483	Jan.	56,945,754		
1942	666,965,595	Feb.	51,654,754		
1943	971,929,787	Mar.	56,735,266		
1944	776,993,101	Apr.	50,373,330		
1945	494,819,155	May	47,720,033	Jan.	30,292,452
1946	309,117,564	Jun.	44,125,816	Feb.	29,460,177
1947	335,078,645	Jul.	35,004,689	Mar.	33,322,310
1948	401,359,255	Aug.	30,771,337	Apr.	33,539,453
1949	299,932,909	Sept.	34,658,380		
1950	367,391,228	Oct.	29,561,385		
1951	480,710,719	Nov.	24,510,834		
1952	509,443,629	Dec.	26,212,419		
1953	487,376,997				

Our platers would not use anything but WYANDOTTE "F. S." and "B. N."

—Bud Ebner, Superintendent, Superior Plating, Inc., Minneapolis, Minn.

Wyandotte electrocleaners **F.S.** and **B.N.** are doing a whale of a job for Superior Plating, Inc., important plating job shop, Minneapolis, Minn.

Bud Ebner, Superior's superintendent, reports: "We have a variety of cycles set up to handle many different jobs in our shop. In all of these cycles, ***Wyandotte*** **F.S.** and **B.N.** play an important part. **Our platers report definitely better results with these electrocleaners and would not use anything else! We're thoroughly sold on Wyandotte products and service!"**

Try these Wyandotte electrocleaners yourself: **B.N.** is an excellent electrocleaner for ferrous and nonferrous metals. Highly versatile, it is particularly recommended for the job shop. Many shops also use ***Wyandotte*** **B.N.** for stripping chromium. **F.S.** is used for heavy-duty anodic electrocleaning of ferrous metals before electroplating. ***Wyandotte*** **F.S.** combines exceptional detergency for removal of fabricating oils and compounds with controlled foaming, free rinsing and high soil suspension ability. **F.S.** has outstanding solution life.

Use *quality* products for *best* electrocleaning results . . . and still do the job *at lowest use-cost!* Use *only* Wyandotte electrocleaning products, constantly being tested, developed and improved in Wyandotte's new metal-cleaning and electroplating laboratory. Call your helpful Wyandotte technical representative or mail coupon today for details, without obligation. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Angeles 12, California.*

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—Marketing—

Producers of welding equipment and electrode are selling finished goods faster than they are buying raw material. But they are moving up purchasing slightly.

At least a few sources within the industry are betting that their overall welding business will hit within 90 pct of 1953's year-end total. Pressure on wire and rod producers for price reduction is out the window, deliveries must be prompt, orders are firm.

Machines Lose Out

Welding machines, at least several sources agree, have fallen more sharply in sales volume than have electrodes. Slowdown of defense and AEC buying is one factor. Another, the booming wave of capital expansion is slowing. It's been estimated that if 60¢ of each sales dollar went to electrodes in 1951, then 30¢ went for machines, 10¢ for various welding accessories.

By 1953 it's believed that 67¢ of the sales dollar was spent on electrodes, 23¢ on machines, 9.8¢ on accessories. Though this trend is expected to continue, it hasn't offset the upward sales movement of the past 30 days.

Shared Industry's Slump

Welding is moving up. Not in a boom, but at a steady walk. Though National Electrical Manufacturers Assn. figures cover only April, reports from welding material suppliers confirm the rise through May. At least one finds May his best month since August, 1953.

Welding had a poor latter 1953, but the slump was general. Occasional comment from observers outside the industry suggest that welding fell more sharply after July 1953 than some other industries, bounced back less quickly. The bounce was slow, but overall statistics for electrode sales don't confirm their view.

NEMA totals indicate welding electrode sales were better in 1953 than in any year since 1945, with the sole exception of 1952. If

current sales forecasts for electrodes are correct, and the industry hits within 90 pct of its 1953 total, or about 438 million lb of electrode shipped, then only 1951, '52, and '53 would show higher shipment figures in the past 9 years.

Hail New Developments

The impact of new equipment may affect individual company sales this year, but doesn't seem to have had much impact thus far.

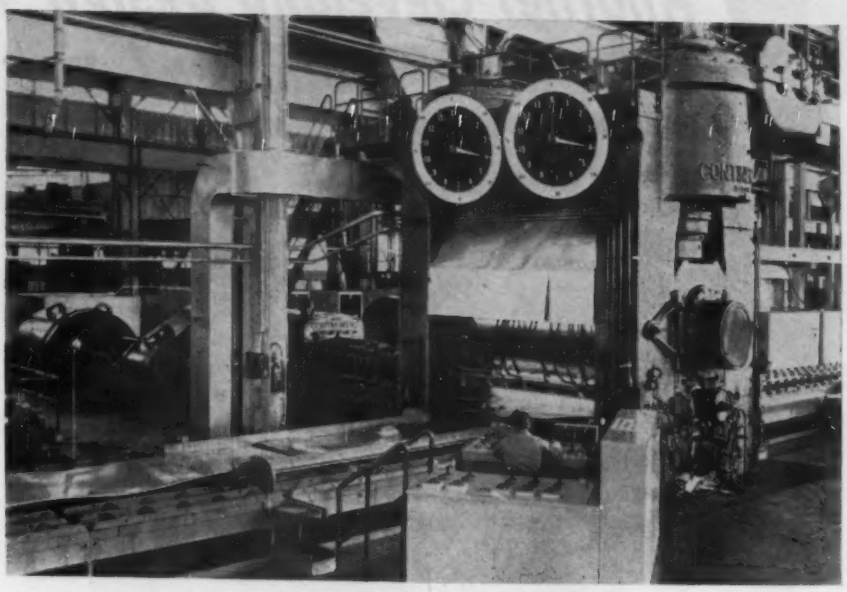
Current developments seem to have more long range effect, as for instance some of the reports from the welding engineers conference at Milwaukee recently. One development that hasn't been exploited greatly: the use of FM magnetic tape recorders to control quality in spot welding, checking for welding failures, and standardization of welding setups, as reported by H. Kitscha of Cutler-Hammer Inc.

Welding Research Grows

Similarly, papers on gas-shielded welding and cathode stabilization (argon-with-oxygen shielding reported by G. M. Skinner and D. M. Yenni of Linde Air Products Co.; use of cathode stabilizers on electrode wires to correct cathode instability discussed by H. C. Ludwig, Westinghouse Electric Corp.; fresh material on spot welding of titanium reported by R. P. Hurlebaus, Budd Co.), suggest work in progress that could affect welding techniques.

Caution is uppermost, as reflected by low purchasing of raw materials by the welding industry. But the pace is quickening.

"That's what I call employee loyalty."



AIR FORCE bombers will get lighter, stronger, cheaper wings as . . .

Mill Tapers Aluminum Sheet, Plate

Larger tapered wing skin panels for Air Force heavyweights will now be available from a new rolling mill that has just gone into production at Aluminum Co. of America's Davenport, Ia., plant. Mill was developed jointly by Alcoa and the Air Force.

Leased from the Air Force along with some auxiliary equipment, the mill can roll tapered sheet and plate up to 10 ft wide and 40 ft long. Maximum taper ratio is about 4.5 to 1. This means the heavy end can be as much as 4.5 times as thick as the thin end over the 40-ft length.

Maximum thickness of the heavy end will be 1.5 in. Minimum thickness at the thin end is expected to be in the range of 0.064 to 0.080 in.

Will Cut Production Time

The tapered material will be used for wing and tail covering with the heavy end at the root and the skin thinning out toward the tip. Advantage is that strength may be built into the wing at the center where it's needed and weight reduced outboard where high stresses are not found. Tapered spar webs may also be made from this sheet or plate.

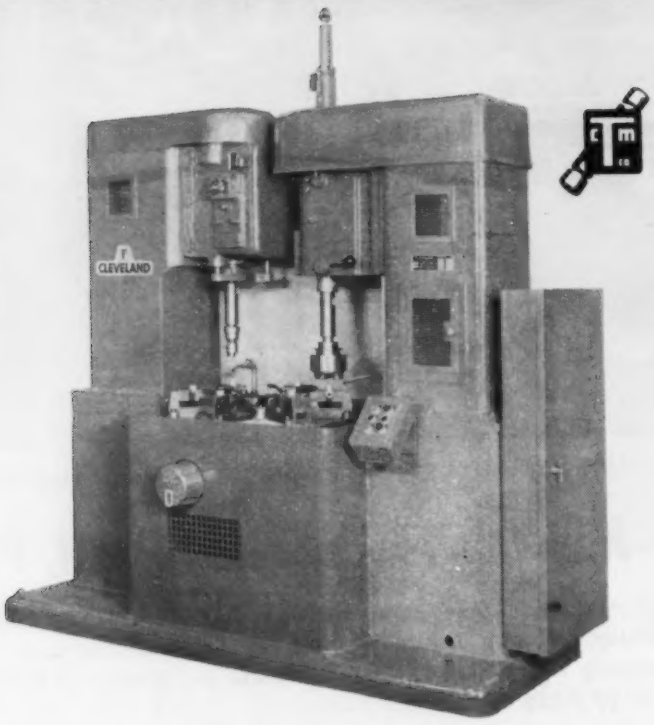
Size of the new product, much larger than previously available roll-tapered aluminum, will cut aircraft production time and cost as well as reducing weight further because much of the joining can be eliminated.

The 144-in. reversing mill will be supplied by previously existing equipment at Davenport. Other newly installed facilities for production of tapered sheet and plate include two new reheating furnaces, an aging furnace and additional roller leveling equipment.

Since transverse and multiple tapered sheet and plate are also used by aircraft builders, Alcoa is leasing from the Air Force a 7 x 40-ft taper grinder and a milling machine capable of machining plates up to 10 x 40 ft. These machines are being installed.

Facilities already available at the Davenport mill plus Alcoa's experience and developments in roll-tapered aluminum sheet and plate were high on the list of factors considered in choosing this as the site for the big new mill. Alcoa also built two new buildings, totaling 52,000 sq ft to house the new equipment.

Another Cleveland Design to Speed Production!



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PARTS: LB type fittings with external threads. Vapoil Connector Bodies 90°. Vapoil Connector Bodies straight.

MATERIAL: LB type fittings of Malleable Iron; other parts of cast aluminum.

A vertical combination machine consisting of a heavy duty Cleveland 21" Power Index Table, mounted on an all welded and normalized steel base with columns to support the machined units.

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The tapping unit is Model E-3 Cleveland Lead Screw Production Tapping Head.

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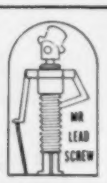


—Production—

Magnesium:

Dow opens world's largest magnesium rolling mill.

The magnesium industry put on its first long pants last week when Dow Chemical Co. dedicated its new Madison, Ill., rolling mill. That's how James S. Kirkpatrick, president of the Magnesium Assn., characterized this major advance.

For technical article on methods and equipment used at Madison, See THE IRON AGE, May 27, p. 111.

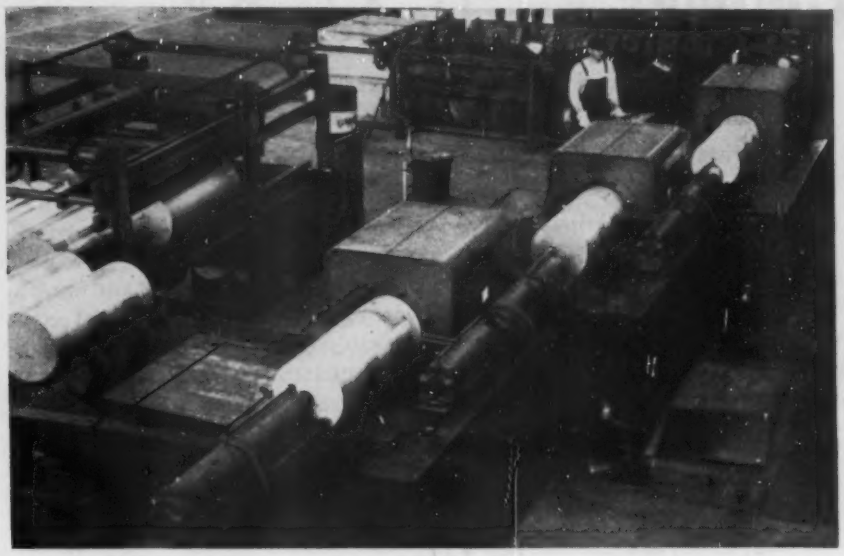
In dedicating the world's largest magnesium processing plant, Dow honored Dr. Edwin O. Barstow, vice-president and director, who has been a key figure in magnesium for 54 years. Dr. Barstow participated in the first successful production of the light metal from brine in 1916 and later took active part in the first successful production of magnesium from seawater in 1941.

While nominal capacity of the new rolling mill is 8000 tons per year, it would be possible to turn out more than 50,000 tons of products annually at Madison—more than the combined capacity of the Dow and government-owned plants at Freeport, Tex.

And Armed Forces representatives stressed that, up to now, it was lack of magnesium fabricating

RUNOUT table for 1700-ton extrusion press at Dow's Madison plant.

CONTRAST 2000-lb magnesium rolling ingot with standard 150-lb ingot.



PREHEATING ingots for 5500-ton extrusion press in induction heaters.

capacity that prevented many military applications where improved performance might have resulted from magnesium's use. About a third of all magnesium produced today is used for defense.

Trying to latch more strongly onto civilian markets, and stressing advantages of light weight for anything that moves, Dow displayed a monocoque truck body fabricated from magnesium. With 3/16-in. magnesium plate side walls, it weighs only 1300 lb against 3200 to 3500 lb for comparable bodies of conventional construction.

Pointing out this country's leadership in magnesium, Dow President Dr. Leland I. Doan said, "In no other country is magnesium as cheap as it is in the United States. In no other country are fabricated magnesium products as cheap. In no other country is there a really substantial commercial industry to act as a base for military needs in time of emergency."

Principal speaker at the dedication was Donald A. Quarles, Assistant Secretary of Defense, who stressed military applications of the light metal. He pointed out the importance of weight reduction in any equipment which must be airlifted—or carried by the infantryman. And he predicted increased use of magnesium as sheet and extrusions become more available and economic.

AUTOMATIC saw cuts off ingot at bottom of continuous casting unit.

WORLD'S FIRST magnesium coil mill at Madison is 84-in. reversing four-high single stand mill.

CONTROLS: Keyed to Asian Policy

Planners weigh nearness of controls . . . Much depends on Southeast Asia situation . . . Plan NATO type pact . . . U. S. action in Asia will affect industry, business.

Is a return to government controls—war or no war—just around the corner? Neither the White House nor the Congress is ready to answer this all-important question yet. But the recent rapid spread of Communist domination to additional land areas of the globe is causing gravest concern among Washington's planners. Background for discussions now underway as to whether or not a return to controls is imperative runs as follows:

United States, its hand being forced by the Indochina situation deteriorating faster than was expected, will make the best deal possible in the form of a mutual security pact for Southeast Asia—but will not wait too long for quibbling allies to make up their minds.

When it comes, the pact, or treaty, will be a NATO-type instrument and will have to be ratified by the Senate. As the situation worsens, the possibility increases that the treaty as presented to the Senate by the White House will be followed closely by a request for standby power to invoke temporary price, wage, credit controls to any extent the White House feels necessary. Control regulations for each segment of industry are rapidly being put on paper by President Eisenhower's mobilization planners.

Treaty for the mutual defense of Southeast Asia—important source of production raw materials—may or may not mean increased military arms shipments abroad, but will probably mean some increase in general defense spending as our commitments grow.

The U. S. is already dumping about all the arms and technical assistance into the Philippines, Japan and the Associated States that they can absorb. Any increase would have to come from new aid to Australia, New Zealand or the independent Southeast Asian countries.

With the Philippines and Japan already in line, a pact could conceivably be presented to the Senate for ratification before adjournment, scheduled Aug. 15, if internal political problems in the other interested nations resolve themselves quickly.

Must Join Us

The President and Secretary of State Dulles both promise that the U. S. will not go into Asia unless the "interested" countries there join us. Nor will we use our strength to bolster French colonialism, but insist that the Associated States be promised freedom. If this policy remains unchanged, and a pact approved, there is a chance that arms shipments will begin to the small countries in Southeast Asia to the extent of several billion dollars in additional government spending.

Possibility also exists that if Great Britain, which now seems intent upon joining Southeast Asian security only through Geneva Conference machinery, shifts her position and enters into the pact, increased aid will go to that country, Australia and New Zealand.

What the U. S. does in Asia—whether we pull out altogether, join in a mutual security pact or participate in some type of United Nations mission—will have far-reaching effects on the prospects for all business and manufacturing. Key to the situation is contained in decisions and talks now going on at top levels, and may be out in the open in the next month or two.

Water Is No. 1 Resource

A belief that water is rapidly becoming the nation's most valuable resource and its conservation and use will in large measure determine the future growth of the country has led President Eisenhower to establish a Cabinet committee to study water resources policy.

Interior Secretary McKay as chairman and Defense Secretary Wilson and Agriculture Secretary Benson as members are assigned by the President to make an extensive review of supply, conservation and use of water throughout the nation. Secretaries of Commerce, Health, Education & Welfare and the Budget Director will also participate.

The committee will cooperate with the Hoover Commission on Government Reorganization which already has a similar study underway. Admiral Ben Moreell, Jones & Laughlin board chairman, is in charge of this survey.

Uphold Overpayment Penalties

Government's right to penalize companies for wage overpayments in violation of the 1950 stabilization law by denying them tax deductions on overpayments has been upheld by the Supreme Court.

In a unanimous opinion, the court also ruled that the government has the right to prosecute violations occurring when the law was in force even though it expired before charges were made.

Decision permits a hearing before an enforcement commissioner to proceed on the government's allegation that Grand Central Aircraft Co., reconditioners of aircraft engines in Southern California and Arizona, paid $5.5 million in wages in violation of the law.

Clarke Heads Defense Transport

Owen Clarke, of Yakima, Wash., an Interstate Commerce Commissioner since last July, is the new head of Defense Transport Administration.

Mr. Clarke succeeded James K. Knudson as the DTA chief. The latter has left the government to enter private law practice.

REPORT TO MANAGEMENT..

What's our defense planning?

Something very strange is happening. It seemed obvious and reasonable that the U. S. would have to step up defense spending to counter the Communist threat in Asia.

Only question was how much would be spent. This was to be determined by whether we decided to: (1) enter into a shooting war in Indo-China, (2) write off Indo-China but draw the line on further Red aggression by taking part in a Southeast Asian Alliance, (3) stiffen our own defenses with a "newer" look--one that would make us better prepared to fight small wars as well as stressing massive A-bomb, H-bomb retaliation, or (4) some combination of these policies.

No matter what course was chosen, it had to mean an increase in defense outlays.

Mr. Humphrey's knuckleball

But last week Treasury Secretary Humphrey threw the nation a knuckleball.

He stated that current Administration planning still calls for a $5 billion slash in government spending for the fiscal year beginning in June. The cut would be made on top of the estimated $7 billion reduction expected during current fiscal '54.

Would mean a cutback

This clearly indicates another cutback in defense spending. It would be virtually impossible to hack $5 billion more off the government budget without the major hunk coming from defense appropriations.

Mr. Humphrey, however, did leave the back door ajar on this commitment. He stated that "We must, and always will spend whatever is needed for our security; that is our first concern" and that "Our plans for cutting $5 billion in the coming year could badly miscarry if adverse serious developments occur in the world resulting in a revision of our future undertakings."

He couldn't mean it

But the implication of Mr. Humphrey's remarks is that right now--we either don't regard the Red threat in Southeast Asia as a "serious development"--and this is obviously impossible--or that instead of being stirred into some sort of action the U. S. intends to retrench--which would be completely out of line with our overall foreign policy.

Result is the Humphrey declaration has only added new doubt to an already confused situation. And the prospect of reduced military spending seems even more paradoxical in the face of new Communist moves in Guatemala.

They're still putting it away

All through the recession consumer spending has remained at a high level, and there have been many indications consumers could spend a lot more if they wanted to.

Added proof of this is the Treasury's tab on sales of savings bonds which for first quarter '54 amounted to $1.77 billion, 14 pct more than in same period last year. And in April, bond sales were the highest for any April since 1945.

Industrial Briefs

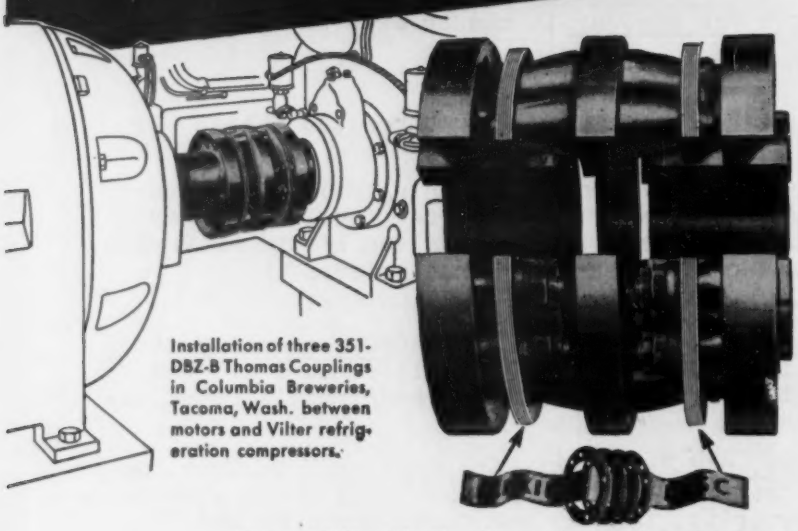
Signs Agreement . . . American Brake Shoe Co. has signed an agreement to purchase the assets of the Metallic Friction Materials Co., Cleveland.

District Office . . . Babcock & Wilcox Co. has opened a new district sales office for its Tubular Products Div. in Cincinnati at 2330 Victory Parkway.

New Store . . . National Supply Co., Ltd., has opened an oil well equipment and supply store at Virden, Manitoba, Canada, and has appointed K. V. Duce manager.

Order Received . . . Luria Engineerneering Co., Bethlehem, Pa., has received an order for two additional standardized buildings from Glen-Gery Shale Brick Corp., Reading, Pa.

THOMAS FLEXIBLE COUPLINGS...
for more years of better service!

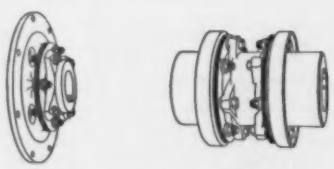


Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

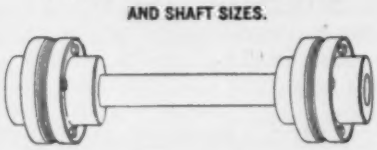
Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES

FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



THOMAS COUPLINGS ARE MADE FOR A WIDE RANGE OF SPEEDS, HORSEPOWER AND SHAFT SIZES.



Write for our new Engineering Catalog No. 51A

THOMAS

THOMAS FLEXIBLE COUPLING COMPANY
Largest Exclusive Coupling Manufacturer in the World
WARREN, PENNSYLVANIA, U.S.A.

Centennial . . . At the Aluminum Centennial Congress to be held at the Maison de la Chimie at the Sorbonne in Paris, June 14-19, William T. Ennor, assistant director of research at Aluminum Co. of America, will present a paper entitled "Aluminum Applications in the Alcoa Building." The Congress will mark the 100th anniversary of the development of industrial aluminum by the French scientist, Henry Sainte-Claire Deville.

Testing Station . . . Rockwell Mfg. Co. has opened a unique meter and valve testing station built expressly for testing meters and valves under actual operating conditions. The station is located near Pittsburgh.

Fore! . . . Metal Finishing Suppliers' Assn. will sponsor once again the annual golf tournament held during the American Electroplaters' Convention. The tournament will be at the Forest Hill Field Club in Bloomfield, N. J., on July 15.

New Location . . . Worthington Corp. has moved its Twin Cities District office to a new location at 807 Thirteenth Ave., S., Minneapolis.

New Prexy . . . Air Pollution Control Assn. elected Gordon P. Larson to the presidency of the association at its annual meeting recently.

Happy Anniversary . . . F. H. McGraw & Co., New York, last week marked its 25th anniversary. Since it was founded, the McGraw company has completed nearly 700 engineering and construction projects in the U. S. and abroad.

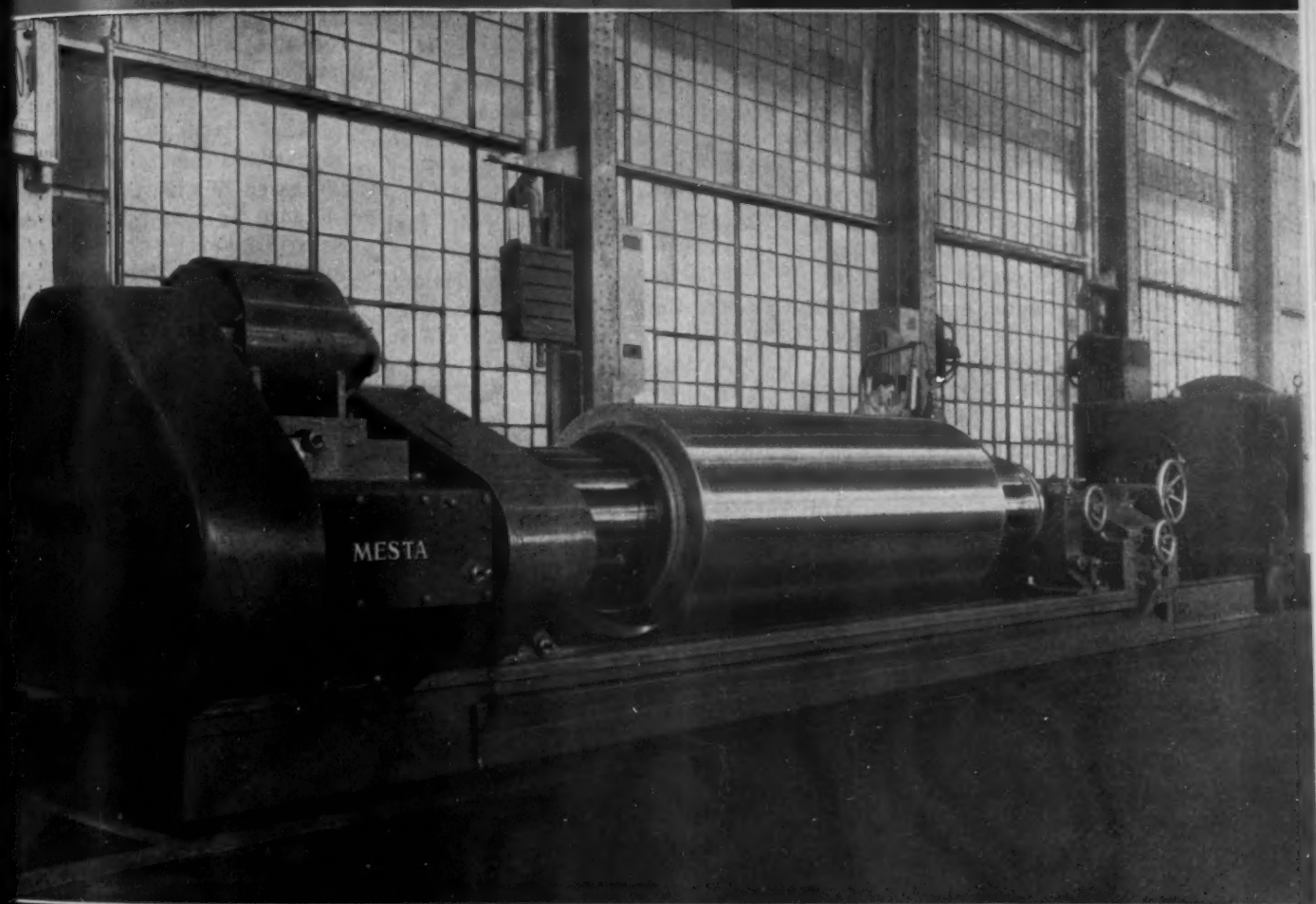
Moved . . . Baron Steel Co. has moved its Detroit sales office to new quarters at 16939 James Couzens Highway.

Hear Ye . . . Rotor Tool Co., Cleveland, has appointed the Big Three Welding Equipment Co. as a distributor of its products in Texas, Oklahoma and New Mexico.

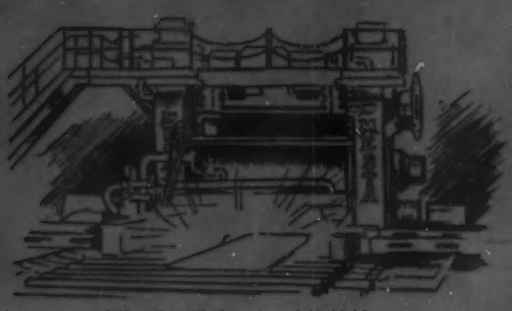
Awarded . . . Thomas E. Eagan, chief metallurgist of Cooper-Bessemer Corp., has been awarded the Joseph S. Seaman Gold Medal by the American Foundrymen's Society for his "outstanding work in the development and dissemination of engineering data on the production and utilization of alloy cast irons."

Heavy Duty ROLL GRINDERS

Designed and Built by MESTA



Mesta Heavy Duty Traveling Wheel Type Roll Grinder
Finishing a 59" x 154" Mesta Backing-Up Roll



DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS

MESTA MACHINE COMPANY • PITTSBURGH, PA.

Dealers Put Heat on Automakers

May effect substantial changes in auto distribution setup . . . NADA presses for new selling agreements . . . Franchises lose value . . . Dealer profits dip—By *R. D. Raddant.*

As the auto industry faces the facts of life of the competitive market, one fact growing more apparent, is that dealers are taking on more importance in the overall picture.

Dealers have already made themselves felt in production scheduling of several automakers. Now they are pressing for revised selling agreements that are apt to change the automobile distributing picture considerably.

One top auto executive told THE IRON AGE in a "background" conversation recently that, "It isn't public opinion that is going to determine auto production, but dealer opinion."

Want Happy Dealers . . . There are a number of instances that show that this has already occurred in some segments of the industry. Studebaker has frankly admitted that its primary target this year is to assure a strong and healthy dealer organization. Chrysler Corp. was faced with a near rebellion of Dodge dealers demanding a $200 price concession. Now the National Automobile Dealers Assn. is determined to negotiate new selling agreements with manufacturers.

Auto manufacturers aren't apt to let things get to the point where dealers are calling the turn. Nevertheless, dealers are well organized in NADA and can now use group influence instead of individual protest.

But more important, an unhappy dealer knows that his dealership doesn't have the value it once had; that if he stands up against the company's sales manager, he has a good chance of getting away with it. After all, there aren't a dozen eager applicants with the necessary capital waiting around for his franchise these days.

Ford, GM Feel Pressure . . . In the less happy areas of the auto industry, it is believed, with some wishful thinking, that Ford and General Motors will feel the dealer pressures this year that were felt elsewhere last year.

They feel that the dealers, rather than top management, will stop the Ford-Chevrolet race in particular.

In this instance, dealers themselves have a stake in the production race. First place means as much to them as it does to the factory and they are willing to make an allout effort, including smaller unit profits, to hold the top spot or take it over.

Throughout the rest of the industry, however, it is felt that when the cost of the race is totaled up at the end of the year, dealers won't be willing to keep up the pace for another turn around the sales track.

"Oh, you robots are all alike."

Profits Drop . . . But, getting back to dealers in general, total sales are good this year, but profit is small. NADA reports that operating profits before taxes for the first quarter of this year are only 0.8 pct against 4.3 pct last year.

In the Detroit area, the number of new car dealers dropped from 382 a year ago to 352 at the present time. Actually, 74 quit and only 44 were added for a loss of 30 during the year.

NADA is in the process of negotiating a new selling agreement designed to give the dealer some defense against his parent company. A key issue will be a proposal to protect the dealer from the possibility of cancellation of his selling agreement without cause, which the auto company now may do if it so desires.

This is aimed at protecting the dealer's heavy investment in buildings and equipment, which often runs into hundreds of thousands of dollars in a typical metropolitan dealership.

Most auto drivers have little sympathy with the dealer. The wounds of the postwar period still hurt in many cases. But times change. Today the dealer finds himself caught between the eager manufacturer and the price-conscious public and he intends to do something about it if he can.

Chrysler Shifts Setup . . . The new word at Chrysler Corp. is "divisionalization" as this automaker attempts to work its way back into good standing as a full-fledged member of the Big Three.

First step in reorganizing Chrysler in the mold of GM and Ford is establishment of each division's independent financial structure. Previously, the parent company ran the entire show with little divisional autonomy or separate accounting.

This was acknowledged last week by E. C. Quinn, Chrysler

Div. president, with the appointment of a new comptroller to head his division's financial end.

"As a result of this and other moves toward complete divisionalization we will be able to continue our program of constantly improving our product while becoming increasingly competitive," he said.

Under the new policy the division will establish its own independent financial, cost and price analysis sections, giving management the divisional information it needs "to meet competitive situations."

Shiftless Trucks Gain . . . R. C Woodhouse, general sales manager of GMC Truck & Coach, reports that Hydra-Matic sales show a trend in the use of automatic transmissions in the truck industry that closely follows the pattern of passenger cars.

In the light duty bracket, Hydra-Matic sales have jumped from 13 pct to more than 25 pct in the past year. In medium lines, where 8-speed Hydra-Matic was introduced this year, sales have gained from 5 to 18 pct in the 5 months since model introduction.

Introduce Nash-Healey Hardtop

The 1954 Nash-Healey Le Mans hardtop with the continental coachwork of Pinin Farina was introduced last week with a new "low" price of $5128 f.o.b. coastal point of entry.

The low, racy model with the recognizable Farina touch combines American and European engineering with European sports car styling. Major mechanical parts are manufactured by Nash in the U. S. The sports car chassis with "trailing link" front suspension is made by Donald Healey Co., England, while the bodies are hand built in Farina's Turin, Italy, custom body plant.

The 140-hp Nash Ambassador engine powers the Healey and a 3-speed synchromesh transmission is operated with a floor-type shifting lever. Overdrive is standard equipment. The "trailing link" suspension consists of independent suspension with coil springs for improved road hold and cornering.

Expansion:

McClouth taps first heat of 200-ton electric furnace.

Hand of the auto industry gave a subtle assist last week when the McLouth Steel Corp. tapped for the first time a new 200-ton electric furnace.

The new furnace, the world's largest electric unit, is the first of two to be installed at McLouth and the initial unit of the company's $105-million expansion program to go into operation.

Second 200-ton furnace will be ready by June 15 while a blast furnace, ore docks, and oxygen converters are also under construction. Program will make a completely integrated operation of this electric mill in Detroit's downriver area.

The auto industry figures to the extent of a $25-million investment in the expansion by General Motors plus the obvious drive by Detroit steelmakers to reap a larger share of the automaker's steel requirements through increased capacity.

When the expansion program is completed, it will increase McLouth's capacity from 579,700 tons to nearly 1,250,000, an increase that could put it in twelfth position in the industry.

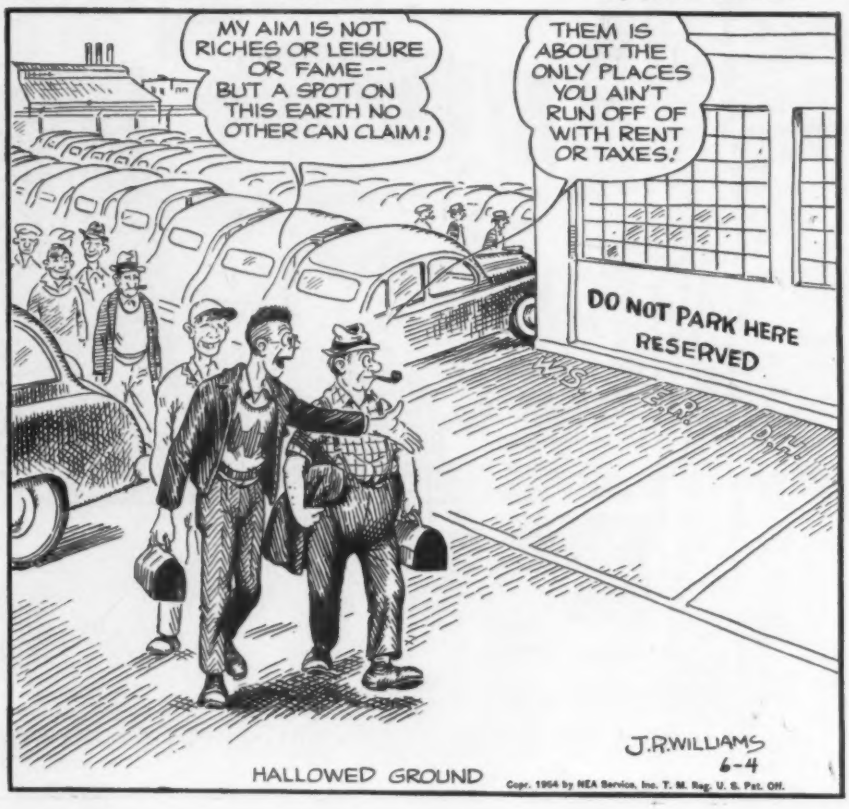
In addition to the melting capacity, new facilities will include five new batteries of soaking pits of two holes each, ingot sizes increased from 20,000 lb to 34,000 lb, a six-stand hot-mill as well as new cold-rolling facilities.

Automotive Production
(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
May 29, 1954..	126,099*	23,497*
May 22, 1954..	134,333	23,660
May 30, 1953..	110,201	15,667
May 23, 1953..	140,060	22,387

*Estimated. Source: *Ward's Reports*

THE BULL OF THE WOODS By J. R. Williams


MY AIM IS NOT RICHES OR LEISURE OR FAME-- BUT A SPOT ON THIS EARTH NO OTHER CAN CLAIM!
THEM IS ABOUT THE ONLY PLACES YOU AIN'T RUN OFF OF WITH RENT OR TAXES!
DO NOT PARK HERE RESERVED
J.R.WILLIAMS 6-4
HALLOWED GROUND
Copr. 1954 by NEA Service, Inc. T. M. Reg. U. S. Pat. Off.

Built for Better Production

Hardtem Die Blocks

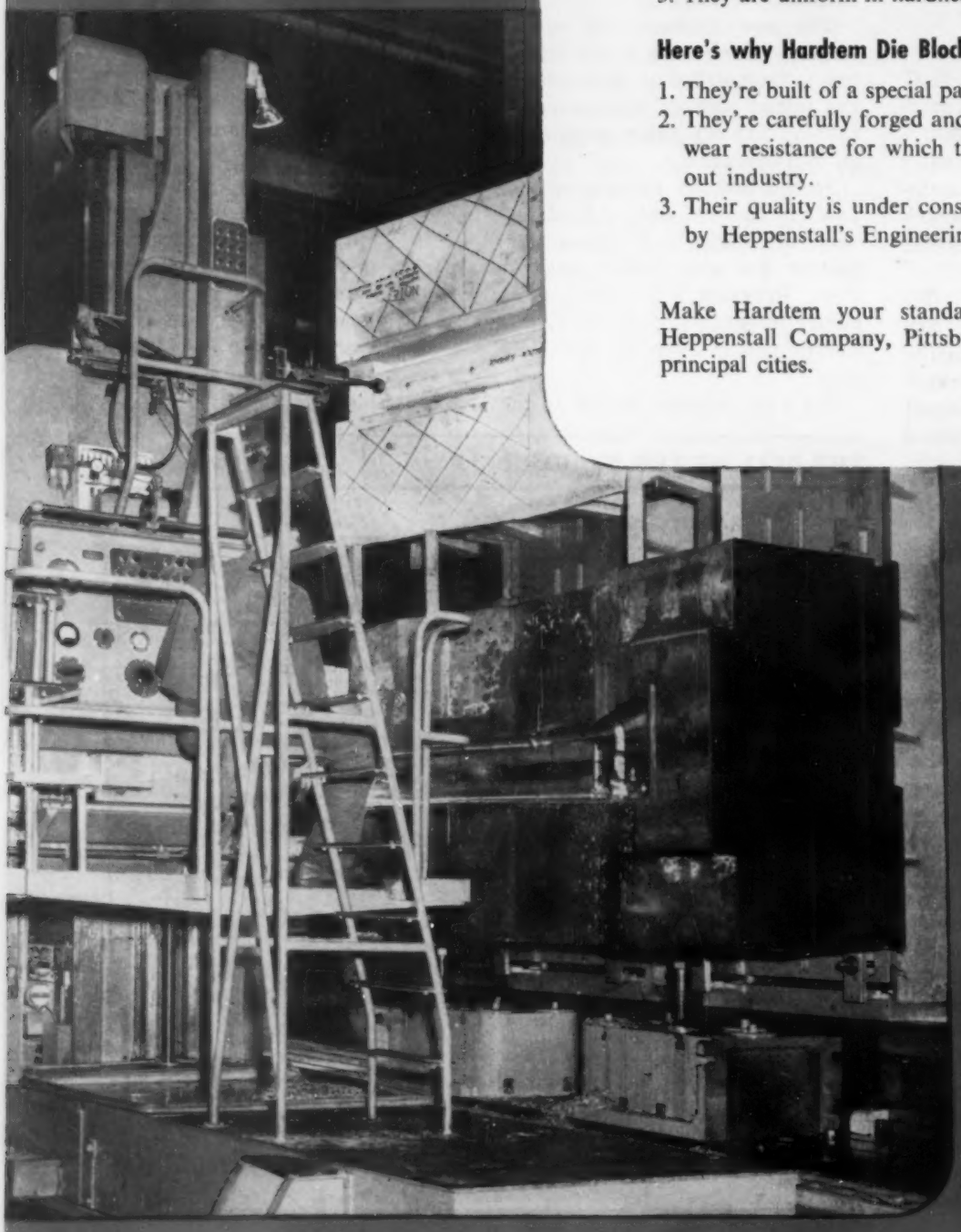
Here's what Hardtem Die Blocks mean to Better Production!

1. They're tough . . . they resist impact stress.
2. They withstand heat.
3. They are uniform in hardness.

Here's why Hardtem Die Blocks assure better results!

1. They're built of a special patented Heppenstall Steel.
2. They're carefully forged and heat treated to provide the wear resistance for which they are recognized throughout industry.
3. Their quality is under constant study and development by Heppenstall's Engineering and Research staff.

Make Hardtem your standard die block specification. Heppenstall Company, Pittsburgh 1, Pa. Sales offices in principal cities.



Heppenstall

. . . the most dependable name in die blocks

Ike Set To Avoid Shooting War

Promises no action without Congress OK . . . Plans no troop involvement . . . Give only material aid to anti-Communists . . . See no increased controls now—By G. H. Baker.

The new rash of Communist assaults around the world (Guatemala, Morocco, Malay Straits) is a cause for grave concern, both within Congress and in the Administration. President Eisenhower, no less than Congress, is grimly determined to avoid becoming directly involved in putting out the new fires of aggression.

Result is that for the time being at least, the U. S. anti-Communist campaign will continue to be limited to material aid. Drafted U. S. troops definitely will not be called up, under present plans, to fight in any foreign wars. Technical personnel, on a strictly volunteer basis, will be employed in a limited way.

Won't Increase Controls . . . The control picture on the home front is not headed for any immediate changes, as a result of this tight situation. There may be relatively minor re-shufflings of the existing controls over scarce materials. A tightening up of nickel controls is a possibility. But all-out controls over prices, wages, and end-uses of materials and products will not be voted except under wartime conditions.

Mr. Eisenhower has promised he will not commit the U. S. to war without first consulting with Congress. This means the chances of a U. S. declaration of war are very thin, for the Republican majority, pre-occupied with the tough problem of trying to increase its hair-line majority of seats in an off-year election, has no wish to annoy the voters with talk of war—no matter how "limited" the war might appear to be at the outset.

Cut European Aid . . . Western Europe's mushrooming capacity to produce industrial goods is due for another round of expansion. Built up almost from scratch since the end of World War II with U. S. dollars and local determination, the plant capacity of Western Europe now is in excellent position to offer serious competition to the metalworking and chemical industries here at home.

The Eisenhower Administration is asking Congress to appropriate $20 million for Western European industry in the fiscal year starting July 1, 1954. Many congressmen believe, however, they can no longer justify voting large sums to aid manufacturing abroad while unemployment plagues many industrial cities at home.

State Dept. argues, however, that the U. S. must build up European purchasing power, otherwise "we're going to have these people on our backs forever."

Check Welfare Funds . . . A special House subcommittee is picking up President Eisenhower's suggestion that somebody find out how union welfare funds are spent. Mr. Eisenhower asked Congress to take a close look at welfare and pension funds set up under collective bargaining agreements and take appropriate action to plug any "leaks."

For some time, reports alleging misappropriation (operation of night clubs, for example) of welfare funds have been arriving at the Capitol from different parts of the country. Hearings on the charges will get under way in June.

Release More Nickel . . . Although still in extremely short supply, more than twice as much nickel will be available for civilian use this year than in 1953, according to government sources. U. S. Commerce Dept. says nickel for non-military uses in the last half of this year will equal the tonnage distributed in the first two quarters. Increase this year resulted largely from reductions in military requirements.

Name New Scrap Violators . . . The government is broadening its complaint against certain trading practices in the scrap industry It is adding a major steel producer and an export broker to the long list of respondents named in the original complaint.

Bethlehem Steel Corp. and its subsidiaries Bethlehem Steel Co., Bethlehem-Pacific Coast Steel Corp. and Hugo Neu Corp., New York,

Quote of the Week

In the past, our people have had the courage to take a firm stand at the critical moment.

We took such a stand in 1950 in Korea.

We have come to one crossroad after another as we travel along the highways of our destiny and as surely as I stand here, we are approaching another.—Admiral Robert B. Carney, Chief of Naval Operations.

(*Advertisement*)

You can simplify purchasing . . . improve design . . . speed production

with improved C-D-F DILECTO® laminates

Only C-D-F, the Continental-Diamond Fibre Company, makes Dilecto laminated plastic, just as only Cadillac makes a Cadillac. Dilecto is 50 different materials with more combinations and variations in desired properties than we can tell you here.

But Dilecto has three important qualities that you should think about if you buy, design, or machine laminated plastics.

DILECTO HAS HIGH MECHANICAL STRENGTH

Mechanical strength is frequently an important determining factor in the selection of an insulating material. Insulating parts used in large electrical power equipment are frequently bulky. The high mechanical strength of Dilecto helps reduce size-dimensions of insulating parts without danger of failure. Instruments, meters and small motors frequently require very small insulating parts which must withstand comparatively large mechanical stresses. Insulation for use in high frequency circuits should have a minimum bulk factor for minimum dielectric losses. Dilecto fulfills these requirements with a combination of high mechanical strength and low loss factor, characteristic of the better C-D-F electrical grades.

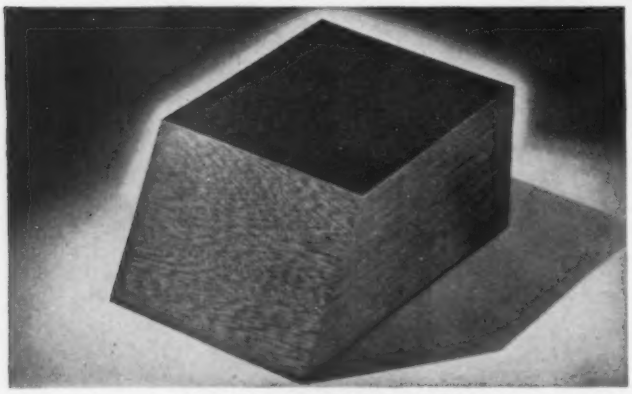
So C-D-F selects for your Dilecto insulation grade the correct, highest quality base material, paper, cotton, nylon, glass. These are used in combination with improved penetrating resins: Improved Phenolic, New Melamine, New Silicone, New Teflon, all synthetic, well polymerized resins.

Both the base and the resin are good insulators by themselves. But C-D-F sells them to you in an improved, practical form . . . Dilecto. Uniform sheets, tight tubes, strong rods, close tolerance machined and formed specialties, high bond strength metal clads.

Why does Dilecto combine so well mechanical strength with dielectric strength and dimensional stability? Because Dilecto is almost homogeneous, a true blend of resin and base.

DILECTO IS ALMOST HOMOGENEOUS

A poor laminate absorbs moisture at its edges, loses its insulating properties fast. Entrapped moisture and other volatiles within the cured structure causes inconsistent dielectric strength, with ultimate puncture and breakdown.



Punch press and bench saw operators know how much time and material is saved when the laminated plastic is *uniform* and *homogeneous* in nature like Dilecto.

DILECTO IS IMPROVED

Yes, C-D-F Dilecto is an improved laminated plastic, due to high standards and advances in resin and manufacturing techniques. It is watched by skilled workers in our modern plants, checked against rigid standards . . . C-D-F standards . . . by our quality control people. It is easy to machine, and the C-D-F shops are doing a booming business in specialties.

Table I—Typical Improved Phenolic Laminates

Commercial designation[a]	Resin	Filler	Improved properties	Improvement due to:
MEC-5	Phenolic	Nylon fabric	Insulation resistance; moisture resistance	Filler
XXHV-2[b]	Phenolic	Paper	High dielectric strength parallel to laminations	Resin and manufacturing technique
CRD	Phenolic	Cotton mat	Better machining	Filler
XXXP-26[b]	Phenolic	Paper	Insulation resistance; moisture resistance	Resin and manufacturing technique
C-92	Xylenol[c]	Cotton fabric	Alkali resistance	Resin
CF	Modified phenolic	Cotton fabric	Postforming	Resin

[a] All grades are Continental-Diamond Fibre Company.
[b] Resins have improved penetrating properties and the manufacturing techniques use these properties to provide better impregnation of the filler. Since thorough impregnation eliminates entrapped moisture and air, greater moisture resistance and better dielectric properties are attained. Manufacturing techniques also provide suitable temperature control during the curing stage to assure uniform quality and optimum property values in the finished laminate.
[c] Xylenol is essentially a dimethyl phenol.

—from Electrical Manufacturing Article "Wider Design Opportunities with the NEW Phenolics", Part II.

The next time you think of laminated plastics, the name to remember is C-D-F Dilecto. The improved, high strength, uniform material that makes insulation buying and using more a science, less a puzzle. New grades, new applications, new savings are just part of the Dilecto success story. Look up the facts in Sweet's Design File, or write for catalog. Send us your blueprint for quotation . . . tell us your design dream . . . C-D-F wants to work with you.

CDF *Continental-Diamond Fibre*

CONTINENTAL-DIAMOND FIBRE COMPANY
NEWARK 85, DELAWARE

are named in a Federal Trade Commission request to one of its hearing examiners asking that the original complaint (which named Luria Brothers and 16 producers of iron and steel) be expanded by the addition of the new respondents.

Government lawyers explain that they lacked certain data on Bethlehem scrap operations at the time the original complaint was drawn up, and hence did not name the firm as a respondent at that time.

Government's charges against Bethlehem parallel those against other iron and steel companies named in the complaint.

Charges against Hugo Neu are that the firm entered into exclusive dealing arrangements with Japanese steel mills to the detriment of free competition.

Hearings on the complete government charges are to get underway this summer.

Layoffs:

Separations top hirings . . . Most in durable goods.

Hiring at manufacturing plants in April, 1954, dropped below March to the lowest rate for the month in recent years and layoffs remained about the same as an employment rise which started in March faltered.

Hirings dropped from 28 per 1000 employees in March to 24 in April. Durable goods principally were responsible as nondurable goods as a whole showed no change. Sharpest reductions in hiring came in transportation equipment, ordnance, lumber and furniture industries, new Bureau of Labor Statistics figures show.

Unchanged layoff rate from March to April of 24 per 1000 employes made this April the worst in 5 years. Relatively large increases in layoffs were reported in machinery, electrical machinery, instruments, tobacco and apparel. Primary and fabricated metals, transportation equipment and food reported reduction in their layoff rates.

Total separations from factory payrolls for all purposes were at a rate of 39 per 1000 employees, well below April rates for the previous 3 years because of decreases in persons quitting their jobs. But it exceeded the hiring rate by the largest margin for the month since 1949.

Court Upsets NLRB Ruling

A firm that moves its plant for economic reasons and not to avoid bargaining with a union need not reeinstate discharged employees nor pay them back wages, the Fifth Circuit Court of Appeals has ruled.

National Labor Relations Board had ruled that the Mount Hope Finishing Co., of Massachusetts, was guilty of an unfair labor practice in closing its plant and moving to North Carolina. The company, contending that it had been planning to move south long before the Textile Workers (CIO) moved in, appealed the NRLB ruling and won.

Any company, having committed no unfair labor practice, has the right to close its plant without consulting the union and to endeavor to save some of its investment, the court held.

ICC to Hold Truck Rate Hearings

Hearings before Div. II of Interstate Commerce Commission on its investigation into rail and truck common carrier and contract truck rates for iron and steel articles transported in the eastern territory have been set for 9:30 a.m. July 6 in Washington.

ICC previously refused to suspend reduced rail tariffs on iron and steel products, but agreed to investigate them after complaints were filed by both common and contract truckers to determine whether the reduced rates might precipitate a rate war.

New rates have been in effect since Mar. 26.

Strongest result of the action could be a minimum rate for the area. At a later hearing, as yet unscheduled, ICC will hear evidence from shippers, cost studies for contract carriers, and rebuttal.

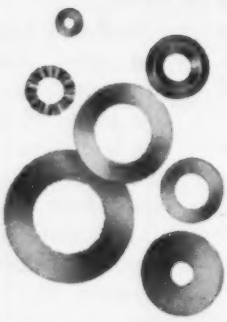
GAS MASK MUZZLE gives tear-gas protection to a striker's dog on picket line at strike-bound plumbing plant in Kohler, Wisc.

If You Need
SMALL PARTS IN A HURRY
plus sound engineering service
YOU CAN'T BEAT GARRETT!

SPRING LOCK WASHERS

Garrett Controlled Tension spring lock washers assure greater holding power, longer life of every assembly. Garrett makes a complete line of lock washers to ASA and SAE specifications, plus many special types . . . in all metals and plated to your requirements.

FLAT WASHERS



Garrett gives you fast delivery from stock on the largest line of flat washers available. Precision-made in thousands of different sizes and types—standards and specials. Also made to your exact specifications to meet the individual needs of your product.

HOSE CLAMPS

AN 737 . . . stainless steel, radial type with floating bridge and thumb-screw adjustment. Approved for aircraft use.

QS-100 & AN-748 . . . worm-type, self-locking screw. Plated to prevent corrosion. Approved by Armed Forces.

AUTO-SEAL . . . screw-type adjustment, scarfed tongue prevents pinching. Staked bolt and captive nut. Rustproofed.

STAMPINGS

Quick deliveries on small and medium stampings made to your specifications on automatic, high-speed precision presses. Finishing equipment includes tumbling, polishing, heat treating and plating.

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Please send me without obligation complete data and technical details on Garrett parts.

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Garrett
OF PHILADELPHIA

GEORGE K. GARRETT COMPANY, INC. **PHILA. 34, PA.**

Western Foil Output Gets Big Boost

New aluminum foil mill to add 3000 annual tons . . . Can roll widths to 54 in . . . Kaiser may add eastern foil mill . . . Can makers eye soda pop developments—*By T. M. Rohan.*

Western aluminum foil production this month is in for its biggest shot in the arm.

The lone producer, Kaiser Aluminum at Permanente, Calif., is supplementing its 1948 rebuilt German mill with a new $1.5 million Loewy mill and complete accessories. Mill is currently being broken in on scrap and regular production is expected by the end of June. Major development will be an increase in maximum width rolled from the present 30 in. to 54 in. Capacity will also be increased from present 6000 tons per year to 9000 and maximum output is 3000 fpm.

New Eastern Mill? . . . A Kaiser Aluminum representative also said, since a heavy percentage of output goes to eastern mills, active consideration is being given by the company to putting up a foil mill somewhere nearer the center of the market. Present German mill was originally scheduled for installation at the Trentwood, Wash., sheet mill whose output it utilizes. It was finally set up near the Kaiser-owned Permanente cement mill south of San Francisco adjacent to the wartime magnesium plant which ceased operations immediately after V-J Day.

New mill is capable of turning out aluminum foil from 0.005 to 0.00025-in. and intermediate thicknesses, due to improved lubrication methods developed for the sheet. Comparable installations generally use two or three mills.

Foil Spurts Ahead . . . Tremendous growth of aluminum foil in food packaging, cigarettes, labels and other printing has made the expansion into greater widths almost mandatory. Printing presses for labels and enclosures have generally been set up for wide widths and widening the aluminum reduces final costs and ups output from existing equipment.

Demand for the aluminum foil has increased so that the German mill has run at capacity almost since installation. It has undergone so many changes, however, that little beyond the mill stands are original equipment.

An example of the mushrooming market demand is a producer of frozen turkey dinner. Initial output was 10,000 daily using an aluminum foil plate packaged in a carton. Chicken dinner was added and total output is now 90,000 daily. Frozen veal dinners are next on the list.

This firm also recently found that using a total aluminum wrap permits Mama to dawdle 50 pct longer on the way home from the grocery before the dinner begins to deteriorate. So foil requirements will probably double.

Other Uses, Too . . . In electronics the story is the same. Telephone, radio and television demand for foil-wrapped condensers has been heavy. Color TV sets use double the number of condensers and are just getting started. Bakery goods are another looming market. Traditional 0.005-in. thick formed container was too expensive. Now 0.0035-in. laminated to cardboard with an adhesive which will stand oven temperatures is turning the trick. Bright aluminum labels are proving better attention getters than paper in fiercely competitive supermarket merchandising.

And conversion of conventional lithographic equipment to aluminum foil is relatively simple. Even in printing, aluminum foil plates are making inroads on engraver's zinc for halftones.

"And this is our crude oil expert!"

L. A. Expansion On Up . . . Latest Los Angeles County industrial expansion figures for April indicate the town is still growing.

Nine new plants announced for the area in April represent $1.5 million investment and 273 jobs. Thirty-five existing plants were to be expanded at $17.8 million investment with 1676 new jobs. Total for the year through April is now $52.7 million compared to $49.8 million in the comparable 1953 period. This included 29 new factories at $9.5 million and 111 expansions at $43.2 million.

Watch Pop Cans . . . Indications of the tremendous potential of the canned soda pop business were given by a top U. S. can maker in San Francisco last week. Wm. C. Stolk, American Can Co. president, told the security analysts the potential is 13 billion cans annually which would require 250 lines of canmaking machinery at almost $250 million investment. He said the Big Five (Coca-Cola, Pepsi-Cola, Seven-Up, Dr. Pepper and Canada Dry) are closely watching Hoffman Beverage Co., which introduced flat top pop cans in New York 2 weeks ago.

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Sincerely yours,
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Charles Davis
Charles Davis
Asst. Superintendent

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Backlog Slumps Deeper in April

Domestic and foreign sales, shipments decline again . . . Output higher . . . Backlog dips to 4.1 months . . . Builders offer easier credit . . . Firm rebuilds tools—*By E J. Egan, Jr.*

Machine tool industry sales dropped to a post-Korean low in April. National Machine Tool Builders' Assn.'s new order index for the month fell to an estimated 142.6, 27 points under the March rate of 169.6. In April, 1953, this index stood at a healthy 276.8.

Estimated orders from foreign customers also dipped in April. Preliminary figures added up to 15.9, lowest in the past 12 months and 9 points under March.

Another drop was reported in April tool shipments. This index is estimated at 302.6 compared with 327.2 in March and 372.7 in April last year. Only April index to make a favorable showing is the demonstrated production rate. This is estimated at 378.4, up from March's 373.0. A year ago, production was gaged at 408.7.

Backlog Drops . . . Ratio of unfilled orders to demonstrated production rate, which measures backlogs in terms of months, is estimated by NMTBA at 4.1 months for April compared with 4.6 in March and 7.7 last April. In September, 1951, machine tool backlogs peaked at 23.5 months.

This across-the-board drop in new orders, foreign orders and backlogs has many builders concerned. Not all were affected by the April slump, and a few checked by THE IRON AGE report May business as very good. Some firms cannot promise delivery of equipment in less than 18 months. But others are faced with shorter hours, labor layoffs, poor sales prospects and a general belt tightening until things pick up.

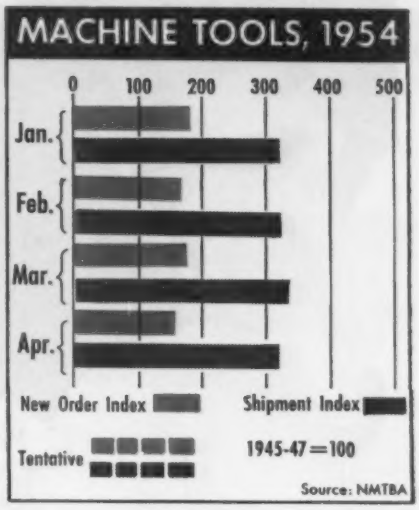
Favor New Tax Bill . . . The industry feeling persists that Congressional passage of the new omnibus tax bill will give machine tool sales a much needed boost. Liberalized depreciation allowances on new capital equipment have been approved by the House. But the Senate Finance Committee hasn't officially confirmed the House recommendations or come up with its own ideas on this important matter.

Conceivably, a great many machine tool prospects are waiting for firm tax rulings on depreciation before they start buying. But as time goes on, builders are beginning to wonder if there will be a buying wave. In recent years they've been conditioned to view month-to-month sales fluctuations as a direct result of slight variations in "buying" pressure.

Need More Selling . . . Now the shoe is definitely on the other foot. Real "sales" effort is needed. Still more selling might be called for to explain faster depreciation allowances if they are granted.

Most builders are still cautious about jumping on the tool leasing bandwagon to stimulate new business. This idea is still in the exploratory stage. There are some complicated tax angles to leasing of metalworking equipment. So far, Internal Revenue officials haven't clarified the rules to builders' satisfaction.

Offer Easier Credit . . . Liberal credit terms are being offered to prospective customers as an alternative to the leasing plan. One firm asks 25 pct down, will grant up to 3 years to pay off the balance. Interest rate is a simple 4 pct and the company handles all the paper itself. An especially good customer might even get the down payment shaved a bit.

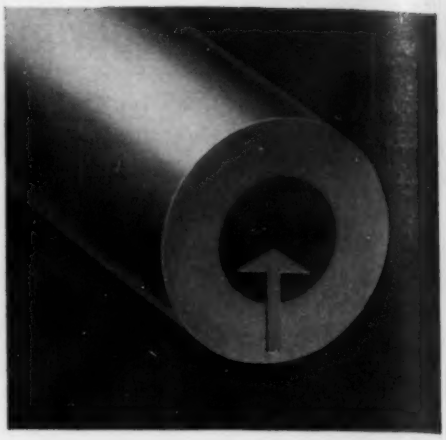


For machine tool users who just can't be sold on easy credit terms or leasing plans, builders have another card to play. Perhaps the owner's old equipment can be brought back to the factory for a "good as new" rebuilding job. One builder has been doing a considerable volume of this work and making it pay.

Don't Lose Money . . . The firm quotes a fixed price to do a thorough rebuilding and reconditioning job on a given machine tool model, regardless of its present condition. They've had some badly beat up specimens come into the shop, but so far they haven't lost money on any of these deals. Actually, due to better shop equipment and methods than were prevalent 20 years ago, the renovated machines, with their new parts, are returned in "better than new" condition.

Busy as they are chasing civilian prospects, builders still keep an ear tuned for Washington rumors about increased defense spending. The rumors appear to have some weight in view of the confused but tense situation in southeast Asia. Machine tool reserves from the Korean conflict are in good shape, but some additional equipment may be needed.

a hole here is annoying . . .



a hole here is helpful

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The Iron Age

SALUTES

George W. Smith

Combines mechanic's itch to make things hum, engineer's interest in methods, executive's efficiency.

EVER since he graduated from Worcester Tech, George Smith, board chairman of The De Laval Steam Turbine Co. and The De Laval Separator Co., has been building a well-deserved reputation as a man who makes things tick.

Whether it be the engines of his 40-ft cruiser or production at Victor Talking Machine Co. where he was works manager some years ago, George's engineering skill, executive ability and driving energy get things running smoothly.

His interest in automobiles, dating from the "get out and get under" days, stood him in good stead at White Motor Co., where he was vice-president in charge of engineering and production—later a director.

George has kept his hand in engineering throughout his business career. In addition to other positions he became president of Smith & Wood, a firm of consulting engineers. Today he's an active member of Society of Automotive Engineers, Society of Naval Architects & Marine Engineers, Institute of Aeronautical Sciences. Last February he was guest speaker at a meeting of the Newcomen Society in North America.

Far from a chair-borne executive, George is always on the go. Seldom found in his office, he often gets work done on a plane or train en route from one De Laval plant to another. He's a firm believer in seeing and experiencing new developments, new methods, new materials, as a timesaver rather than waiting to find things out through lengthy correspondence.

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PARTS FOR GEARS & CAR TRANSMISSIONS are just a few of the many delicate machine tool products Atlantic turns out. Cities Service Chillo Cutting Oil has helped Atlantic maintain their great reputation for quality products.

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QUALITY PETROLEUM PRODUCTS

"Cities Service Chillo Cutting Oil Has Proved To Be The Difference Between Ordinary And Quality Production In Our Shop!"

Here's Atlantic Automatic's story in their own words: "One of our tougher jobs recently was machining SAE 446 Stainless Steel with two forming, one threading and three drilling operations. The critical operation was drilling a .025 inch diameter hole, ⅛ inch deep. The drill would soon pack with chips and break. When a Cities Service Lubrication Engineer was called in, he recommended our using Chillo 44.

"This light-colored oil did the trick. DOWN TIME WAS CUT IN HALF AND DRILL LIFE INCREASED OVER 200%!

"We use Cities Service Chillo 44 to machine all types of metals covering a range of machinability from brass to stainless on our Brown and Sharpe 00G, 0G and 2G Automatics. It has proved to be the difference between ordinary and quality production in our shop!"

The Iron Age

INTRODUCES

Paul Carnahan, elected president, **Great Lakes Steel Corp.,** subsidiary of National Steel Corp.

A. J. Tomasek, elected president, **Walsh Refractories Corp.,** St. Louis.

Frederick E. Coombs, appointed assistant to the president in charge of operations, H. L. Hall Corp., Ltd., Holbeck Corp., Ltd., and affiliated companies, recently acquired by **Salem-Brosius, Inc.,** Pittsburgh.

William H. Klee, appointed vice-president, **Pfaudler Inter-American Corp.**

Harry K. Taylor, named assistant vice-president in charge of operations, **Jessop Steel Co.,** Washington, Pa.

M. J. Boho, vice-president in charge of sales, **Hagan Corp.,** Pittsburgh, has been named general manager of the corporation and all its subsidiaries.

L. Keith Covelle, appointed special assistant to the vice-president and assistant general manager, Aircraft Div., **Kaiser Metal Products, Inc.,** Bristol, Pa.

John L. Worrilow, becomes secretary, **Lebanon Steel Foundry,** Lebanon, Pa.

Joseph G. Keller, named district industrial engineer, **Republic Steel Corp.,** Cleveland.

Myron A. Tracy, joins the staff of the president, **The Garrett Corp.**

George J. Wachholz, appointed controller, **Minnesota Mining & Mfg. Co.,** St. Paul; and **Edward R. Newcomb,** elected vice-president of export sales, International Div.

W. R. Crooks, promoted to chief engineer, Development Div., **The Cooper-Bessemer Corp.,** Mt. Vernon, Ohio; **R. F. Lay,** becomes chief engineer, Product Div.; and **T. O. Kuivinen,** named chief engineer, Technical Div.

George R. Foster, appointed manager, Stainless Steel Div., General Sales Dept., U. S. Steel Supply Div., **U. S. Steel Corp.**

R. J. Stell, named manager, new product development, **The Diversey Corp.,** Chicago; **C. R. Reid,** promoted to assistant general sales manager; **E. M. Petrie,** appointed manager, Technical Service Dept.; **M. J. Butler, Jr.,** named advertising-sales promotion manager; and **H. M. Pickles, Jr.,** appointed assistant to vice-president in charge of sales.

Richard W. Brenneke, named manager, Portland, Ore., sales and service branch, **Iron Fireman Mfg. Co.; John E. Griffith,** named district sales manager, Virginia; **Albert G. Piece,** named a field engineer, New England area; and **Bert L. Desmond,** appointed district sales manager, Detroit market area.

A. W. Horvath, appointed manager, **Erie Concrete & Steel Supply Co., Erie, Pa.**

JOEL HUNTER, elected president, Crucible Steel Co., Pittsburgh.

PAUL W. POLK, elected president, Threadwell Tap & Die Co., Greenfield, Mass.

HUGO LORANT, elected senior vice-president, Hydropress, Inc., New York.

Personnel

G. A. Hardesty, named manager, Production Programming and Control Dept., Tractor & Implement Div., **Ford Motor Co.**

Walter W. Hambrecht, made manager of the Finishing Div., **Standard Pressed Steel Co.,** Jenkintown, Pa.

Lewis J. Lamm, appointed manager, new plant at Livonia, Fisher Body Div., **General Motors Corp.;** and **Franklin H. Sherer,** appointed production manager.

Donald L. Shirley, appointed district sales manager, Seattle, **Link-Belt Co.**

George B. Coale, appointed general manager, Baroid Sales Div., **National Lead Co.**

Victor Z. Brink, appointed assistant general manager, Aircraft Engine Div., **Ford Motor Co.,** Chicago.

William H. Wheeler, appointed sales manager, Holyoke Works Air Products, **Worthington Corp.,** Harrison, N. J.; and **A. C. Nolder,** becomes manager, Air Cooled Compressor Div.

William J. Ervin, Sr., promoted to district manager, Indianapolis territory and the Southwest, **The Carpenter Steel Co.,** Reading, Pa.; **Paul Holtz,** becomes assistant Chicago district manager; **William J. Stephens,** promoted to branch manager, St. Louis Mill Branch warehouse; and **William C. Kunkelman,** named Southeastern manager.

Thomas C. Collins, named district manager, Buffalo office, **Superior Steel Corp.,** Carnegie, Pa.

Alberto H. deGrassi, appointed advertising manager, **Kaiser Aluminum & Chemical Corp.,** Oakland, Calif.

Thomas B. Doe, Jr., appointed master mechanic, **Vickers Inc.,** Detroit.

HERMANN A. BOTTENHORN, elected vice-president in charge of Rolling Mill Div. Hydropress, Inc., New York.

H. G. BAUER, appointed vice-president and general sales manager, De Laval Steam Turbine Co., Trenton, N. J.

R. A. KIMES, named director of engineering, Electronics Div., American Machine & Foundry Co., New York.

FRED C. LINGE, named production and process engineer, Strip Mill, Cleveland district, Republic Steel Corp.

Ten Tons of Steel...

well-done coming up!

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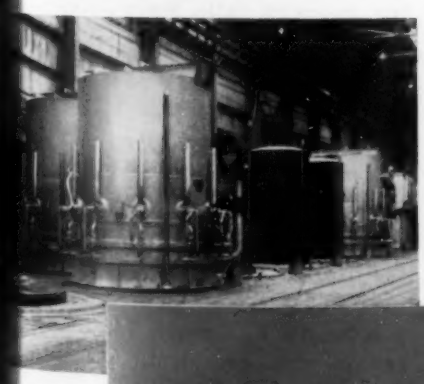
That's why the extreme accuracy and control of annealing found only in the Lee Wilson Single Stack Furnaces are becoming increasingly important to steel makers who are concerned with the quality of their product.



Ever since Lee Wilson developed the present-day method of radiant heating of metals, Wilson engineers have set the pace in annealing equipment design of which the new Single-Stack Portable-Base Convector Furnace, fitted with high efficiency "O" Tubes, is the last word. Details about this amazing new annealing system will be sent to you upon request.

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YEAH--THE SOLID FOOTING WILL BE THE END OF CHARLEY! HE'S TOO OLD TO CHANGE HIS WAYS!
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IA-6/54

—Personnel—

James Bere, appointed assistant general manager, Hamilton, Ohio, plant, **Clearing Machine Corp.**

Rankin H. McDaniel, named general production superintendent, Manufacturing Div., **Solar Aircraft Co.; L. C. Rothchild,** promoted to assistant general production superintendent; and **C. F. Grantham,** named production superintendent of Bldg. 13.

Michael J. Hughes, Jr., appointed assistant metallurgical engineer, **Bethlehem Pacific Coast Steel Corp.**

George F. Henschel, named general manager of sales, New York office, **American Can Co.**

Donald A. Harston, appointed district sales representative, **American Silver Co., Inc.,** Flushing, N. Y.

James B. Hatch, joins Metal Chemicals Dept., **American Cyanamid Co.,** Industrial Chemicals Div., New York.

Robert A. Reese, assigned to New York sales territory, **Standard Pressed Steel Co.,** Jenkintown, Pa.

Monty G. Martin, appointed chief geologist, **Texas Gas Transmission Corp.,** Gas Supply Dept., Shreveport, La.

Edwin T. Jackman, appointed sales representative, Detroit area, **Vanadium-Alloys Steel Co.,** Latrobe, Pa.; and **George R. Brotherton,** becomes sales representative, Midwestern States.

OBITUARIES

Hubert L. Cornelison, 69, who retired two years ago after 35 years in engineering and sales contract work with The Austin Co., suddenly at his home in Richmond, Ky.

Kenneth F. Cooper, 74, retired senior vice-president, American Cyanamid Co., suddenly.

The Iron Age
FOUNDED 1855
Technical Articles

In high production—

Improved Closing Methods Cut Shell Casting Costs

By M. L. Katz
Shell Mold Engineer

S. B. Donner
General Foundry Foreman
Cooper Alloy Foundry Co.
Hillside, N. J.

◆ New methods of closing and securing shell molds are rapidly being developed to improve quality of shell mold casting . . . Dimensional accuracy is more easily maintained and runouts have been reduced.

◆ A thermoplastic resin wood glue has been used successfully for rapid closing of shells in a high production setup at Cooper Alloy Foundry Co. Resin is applied from refillable containers to a hot shell . . . The mating shell is pressed over this and, under pressure the material quickly sets, forming a strong bond between shells.

◆ SECURING AND CLOSING shell molds in high production installations has a marked influence on both casting quality and cost. Present use of thermoplastic resin glue for this purpose by The Copper Alloy Foundry Co., Hillside, N. J., represents a rapid evolution from the C-clamps and pins used to bind and register shells in the "early days" of shell molding.

The hand clamping operation was tedious and time-consuming, and did not prevent gapping at the mold parting line under ferrostatic pressure, particularly with heavy castings. Other methods used spring wire, U shaped nail stock, and spring clips. None of these materially reduced parting line spread.

With light casting sections, some investigators found it possible to hold registered shells together without fastening, by vibrating shot backup closely about the molds. This required considerable care, and runouts were frequently experienced.

For good dimensional accuracy and reproducibility, it is necessary to secure the mold closely around the casting cavities. Probably the most common method, still frequently used on heavy work, involves bolting around the cavities with machine screws and nuts.

Bolting holes in the mold are generally formed by small tapered pins located around the pattern contour and matched on cope and drag plates. Holes formed in the shells are cleared through by rapping a rod sharply

through the capped hole prior to fastening.

A ¼-20 machine screw and nut, driven home by a power screwdriver, binds the shells together. This method still yields best casting dimensional accuracy. The operation, however, is slow and usually prohibitive for all but premium and very heavy castings. Additional efficiency may be derived in some cases by use of positioning jigs, "speed" nuts and quick screw fasteners.

Attempts have been made to stitch shells with heavy-duty stapling machines. Varying mold thicknesses and machine operating pressures, plus shell brittleness, has generally resulted in high mold breakage. In spite of this, the method has proved successful in at least one operation.

Molds assembled and stacked

Bosses formed on the back faces of shells at desired pressure locations have also been used. The bosses, generally surrounding the casting and runner cavity, are either lightly surface ground on the mold backs to an even height from the mold face, or struck-off before curing. Molds are assembled and stacked horizontally, boss to boss. The entire racked assembly is then clamped together pneumatically, the bosses providing points of pressure for tight sealing.

Most high production installations now use quick-setting adhesives. These include organic and synthetic glues; powder, liquid, and tape thermosetting resins; foundry core pastes and binders, and thermoplastic resin glues.

Successful techniques require quick application of a thin line of powder or paste binder around the casting and runner cavity of a freshly stripped and hot mold half. Sealant may be applied by mask, vibration, paste bulb, or pasting jig, or directly from a spool, if tapes are used. The closing shell half, also freshly stripped, is located on the initial half, and the assembled mold placed in a mechanical clamping fixture.

Held until bond sets

Here the shells are held together by spring, air, or hydraulic pressure until the bond has set. This requires from 2 minutes and up, depending on the nature of the bond material and mold temperature. Additional rack setting time may be required before adequate bond strength is achieved.

Adhesives tested in experimental and production line operations have shown widely varying performances. Tapes introduce a parting line spread about equal to the thickness of the tape itself. This has proved objectionable for castings requiring high dimensional accuracy.

Most powder resins cure too quickly on the hot mold for best bond performance. The organic foundry core pastes produce a parting line deviation and any excess squeezed into the mold cavity results in casting "blows" or inclusions. Liquid thermosetting resins have not proved entirely suitable in high production closing operations at Cooper-Alloy.

Early claims which once credited steel shot backing for shell molds with a chilling effect on castings, have not been found valid to date. Steel shot and other fine and coarse metallic shot and grit, sands and gravels, mainly provide mechanical support to the thin shells in resisting mold deflection under temperature and ferrostatic pressure.

Use of shot, grit, sand, and gravel appears to be necessary in production of many shell molded castings. Their use however introduces problems of material handling, cooling, cleaning and reclamation. In addition, the backup material must often be packed by vibration or crammed tightly about the shells. Despite the wide degree of mechanization which can be applied to shot loading and discharge, considerable time and effort is spent in the backup operation.

Bedding-in not required

In work at Cooper Alloy, the authors have preferred to design pattern layouts and gating practices, and to adjust shell thicknesses so that no mold support is required. To date, high production shell molding operations on stainless steel castings, in gate weights of 10 to 135 lb, have never required bedding-in for mold support. Run-out and deformation losses have been extremely moderate, representing a very

RUNOUT at parting line is a problem where springs or clips bind shells at edges and where ferro-static pressure within shell is considerable.

small percentage, cost-wise, of the estimated expenditures required for maintaining a bedding operation.

Cooper Alloy operates two automatic high production shell mold machines with a total 8-hour capacity of almost 1000 multi-cavity molds. Two 8-hour shifts produce a variety of stainless and other high alloy steel castings ranging in finished casting weight, from 1 to 35 lb.

Items cast include valve bodies, bonnets, fittings, and commercial and aircraft castings. One machine, using an individually interchangeable 3-plate setup, produces three complete molds, stripped, cored, pasted and assembled every 2 minutes. Tolerances and finish requirements are high, and the closing and pasting operation must be rapid, accurate, and economical.

Cores placed in shell

Shells are automatically stripped at the end of the molding cycle. The operator removes the ejected shell from the machine and separates it with light pressure into its six component half-shells. This is facilitated by separating notches molded into the shell.

Cores are quickly set into the three "drag" halves, which are then placed on the lower squeeze plates of a closing machine. This unit, a conventional squeezer fitted with interchangeable shell squeeze plates for top and bottom contact, accommodates three molds simultaneously. The plates are of ⅛-in. mild steel, fitted with stock steel studs and springs at the desired mold pressure points. Four squeeze machines handle the entire closing operation, and squeeze plates are easily changed to meet frequent pattern changes on the molding unit.

After positioning the lower shell halves on the squeeze press, the operator dispenses from a refillable plastic bottle, a thin line of sealing compound closely about the periphery of the casting cavity. Pattern of application is usually predetermined for best efficiency with minimum material. The compound is a proprietary thermoplastic resin glue commonly used for wood fastening, and is procured in bulk at wood glue price.

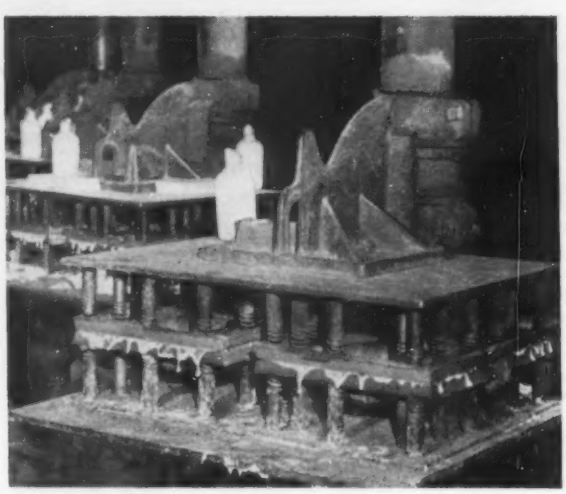
When the sealant has been applied the "cope" halves are located upon the pasted halves, the upper squeeze head and plate swung over the molds, and squeeze pressure applied. Air pressure of 20 lb gives a tight seal.

The thermoplastic thins out under pressure and retained mold heat. When the molds are removed, after an average 5-minute fastening cycle, the thermoplastic has stiffened and dried sufficiently to permit casting within ½ hour. The bond line at the joint is thin and strong, and will restrain even somewhat warped molds from opening at the edges. Bond line thickness rarely exceeds 0.005 in.

A certain amount of bond material is occasionally forced into the mold cavity by an excessive application or a bead placed too closely to the cavity. The thermoplastic resin glue now used has not been found to produce blows or inclusion type defects in the quantities found present even with careless pasting techniques. The material apparently burns off quite rapidly, and without appreciable residue or violent gas emission. When the bond has been insufficiently dried, however, perhaps due to cold pasting, occasional blows are experienced.

After closing, molds are racked by order and alloy until ready for casting, generally a few hours. Occasionally molds are stored for weeks.

THERMOPLASTIC resin wood glue is applied from refillable plastic container on still hot shell half. Other half of shell is then applied.



HOT PLASTIC glue thins out to 0.005 in., sets up fast under squeezer pressure in this high speed closing operation, gives strong bond.

Simple and efficient—

DIE CONTROL PROGRAM Solves Handling, Storage Problems

By V. J. Rokop
Lyon Metal Products, Inc.
Aurora, Ill.

◆ In large metal stamping shops, handling and storing tools, dies and fixtures is a big, often confusing job . . . Major problems are to store items near the proper machinery; keep obsolete dies from cluttering up storage space . . . Add numerous daily orders for new, replacement and temporary tooling and these problems multiply fast . . . An effective control system is a must.

◆ Here's how one firm set up a new, simplified die control program . . . In sorting dies for storage in new style racks, 60 tons of obsolete equipment was uncovered. Paper work involves only three basic forms to take care of all work orders and requests for tooling . . . Copies are destroyed as each department completes its job . . . A running inventory discloses obsolete tooling day by day.

◆ AN EFFECTIVE DIE CONTROL and inventory program for a large metal stamping plant should provide for: (1) Storage of dies near the station where they are most frequently used, (2) an accurate perpetual inventory of all dies and their locations in use or in storage, (3) disposing of obsolete dies as soon as practical, (4) expediting work or delivery orders for new, replacement or emergency dies.

Lyon Metal Products, Inc., Aurora, Ill., has completely reworked its die control system in the past year. Management was certain that a large number of obsolete dies were taking up valuable space in storage racks. First problem was to rearrange locations to keep dies near the stations where they were most often used. Then it was necessary to set up a system to keep obsolete or temporary dies from loading up racks after their usefulness had ended.

Rearrangement of die locations has worked well. The sorting and relocating process turned up 120,026 lb of obsolete dies that were promptly scrapped. Now, with only one lift truck serving a plant about a quarter of a mile long, dies are seldom hauled more than 50 ft to the presses on which they are used.

Units seven shelves high were set up for die storage. Each unit has five openings measuring 45 x 24 x 16¼ in. Shelves in each unit are numbered from 1 to 7 beginning at the bottom and each unit is given a section number. The sections are numbered consecutively through the entire plant, rather than by departments as had previously been done. Where a die is too large for these conventional shelves, 66-in. wide racks are used. They are numbered consecutively in the same manner as the shelves.

A die inventory book lists each die in the plant by its own number, plus the shelf level and section number in which the die is located.

Most department foremen know the exact location of dies in their own shop area and will themselves get those dies within easy reach if they can be conveniently carried. When a die is too heavy or bulky or is located in another department, the lift truck operator is summoned.

"Die Handling Order" is posted near the main aisle for the truck operator to pick up. The die number, shelf and section number are listed in the "Bring Die In" column on this card. The lift truck operator locates the die and delivers it to the proper department, often loading it directly into the machine by means of a special push bar attachment.

When a large die is to be removed from a machine or a department, the foreman fills in the "Take Die Out" column on one of these cards, specifying the exact location that the die is to be taken to.

With adequate storage provided, the next big problem was to plan a continuous inventory and control program that would indicate from day to day which dies were becoming obsolete.

The final system was built around three pieces of paper, designed as temporary forms to avoid cluttering various plant offices with dead paper. Properly used, the forms provide a checking system that will allow no die to remain in the plant more than 6 months unless it is in regular, active service. On this program, a short run die may be scrapped within 30 days.

THESE forms are basic to the die control program. They give specific instructions, prevent verbal shortcuts that can easily overload a big inventory with many obsolete dies.

Route To_____

NEW or REPLACEMENT DIE, TOOL or JIG REQUEST

From:_____ Date_____

To: Superintendent_____

1. Operation Performed and Reason For New Die, Tool or Jig

2. Rework Present Die No. [ ] Yes ☐ No ☐

3. Replacing Present Die No. [ ] Yes ☐ No ☐

4. Make Rough Sketch of Proposed Die on Reverse Side

5. Shop Estimated Cost of New Die, Tool or Jig $_____

6. Quantity Run Per Month_____

7. Savings $_____ Per 100 Pcs._____

8. New Die Tool or Jig Will Reduce Operating Cost Yes ☐ No ☐

9. Approved by Superintendent_____ Date_____

10. Approved by Supervisor Tool Design_____ Date_____

11. Approved by General Production Manager_____ Date_____

ENGINEERING DEPT. RECORD

1. Engr. Estimated Cost of New Die, Tool or Jig $_____

2. Amortized in Months [ ] Years [ ]

3. Management Approval B. O. Request Date_____

4. B. O. No._____

5. Die No._____ Stored in Section No._____ Shelf No._____

6. Final Cost $_____

Rejected Because_____

ORIGINAL—GREEN
DUPLICATE—GREEN
FILE—CANARY

FORM 1515

FILL OUT IN DUPLICATE

Route To_____

SCRAPPING and SALVAGING ORDER

From—Supervisor of Tool Design Date_____

To: Superintendent (Aurora) (York)

1. Please Scrap Die No. [ ]
   Section No. [ ] Shelf No. [ ]
2. Salvage Useable Parts
3. Replaced by New Die No. [ ] Sect. No. [ ] Shelf No. [ ]
4. Replaced Because of Product Redesign Yes ☐ No ☐
5. Original Cost $_____ B. O. No._____
6. New Die Cost $_____ B. O. No._____
7. Deleted From Temporary or Permanent Die Inventory Records Date_____
8. Supervisor of Tool Design_____ Date_____
9. Approved by General Production Manager_____ Date_____
10. Above Die Scrapped—Tool Room Supervisor_____
    Date_____

Route To_____

TEMPORARY or EMERGENCY DIE, TOOL or JIG REQUEST

From—Supervisor_____ Date_____

To—Superintendent

1. Order No._____ Sch. No._____ Cust. Name_____
2. Product_____
3. Description of Operation To Be Performed_____
4. Reason—We Need This Because_____
5. Approx. Cost $_____
6. Approved by Superintendent_____ Date_____
7. Approved by Supervisor Tool Design_____ Date_____
8. Approved by General Production Manager_____ Date_____
9. Assign Temporary No. [ ] By Supv. Tool Design

ENGINEERING DEPT. RECORD

1. Recommend Scrapping Yes ☐ No ☐
2. If Not To Be Scrapped Reason_____
3. Die Scrapped Yes ☐ No ☐ Saved Yes ☐ No ☐
4. Removed From Temporary Inventory Yes ☐ No ☐ Date_____
   or Assigned New Permanent No. [ ]
   Stored Section No._____ Shelf No._____ Date_____

ORIGINAL—RED
DUPLICATE—RED
FILE—CANARY

FORM 1515

New tools and dies must be properly ordered, cannot leave the tool-room without being assigned a number and shelf storage space.

When a stamping department supervisor learns that one of the permanent dies, tools or jigs must be replaced, he files a "New or Replacement Die, Tool or Jig Request" on a top priority paper form. This is filled out in triplicate. The original and first duplicate are colored green. A file copy (canary color) is retained, and the green original and duplicate are forwarded to the plant superintendent for preliminary approval or rejection. If he approves he signs both copies and forwards them to the tool design supervisor for his approval.

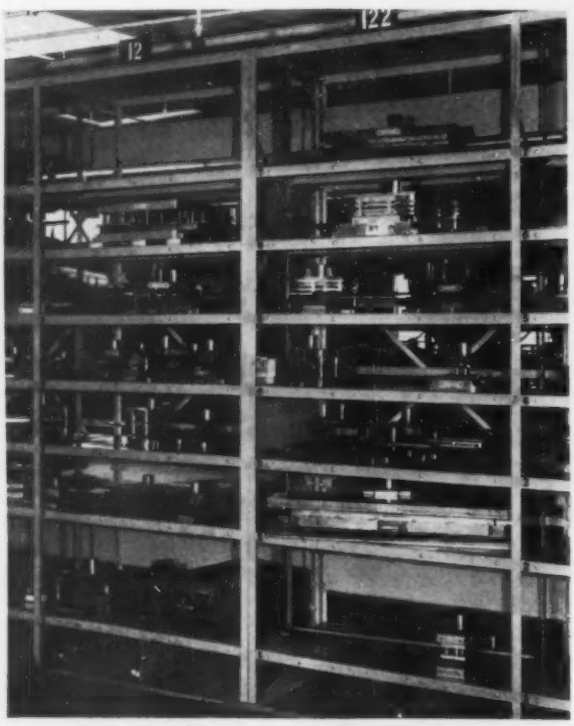
If the item requested exceeds a $50.00 value, the forms go to the general production manager. If approved, they are returned to the tool design supervisor who files the original copy of the approved request and routes the second copy as a work order through the superintendent to the tool room supervisor.

Upon delivery of the replacement item to the stamping department, the department supervisor destroys his canary colored file copy. The copy used as a work order is signed by the tool room supervisor when the job is completed and returned to the tool design supervisor.

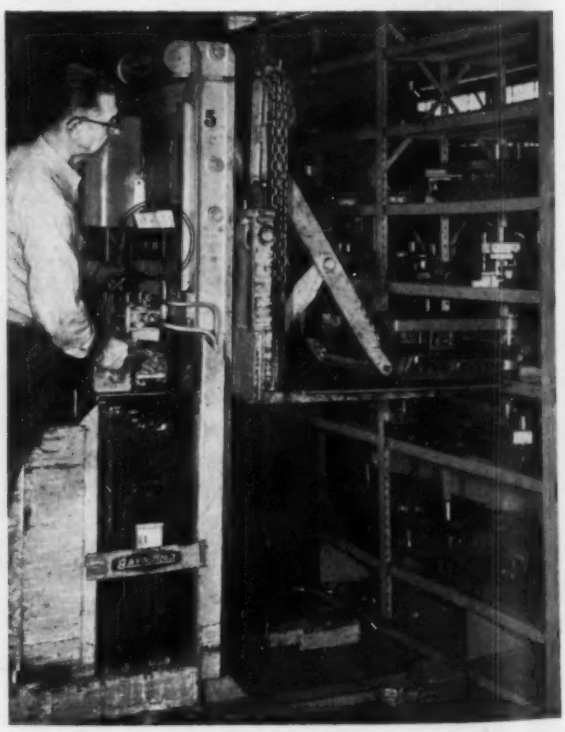
Sometimes a new die is needed for a particular stamping operation that cannot be handled with a general purpose die. Or possibly the stamping department supervisor will ask for a new die to save extra operations. In these cases, he will request a new die on the same green and yellow forms. The same procedure then follows as in the case of a replacement die, except that the tool design supervisor will issue a formal die number and specify exactly where the new die is to be stored. The tool design supervisor enters the new die number in his overall inventory and destroys his file copy of the approved "New Die Request." No dead papers remain.

In summary, no new die, tool or jig, however small in size or value, can be made without the authority of the tool design supervisor; and no die, tool or jig may leave the tool room without being assigned a proper die number and a definite storage space.

By referring to his records, the tool design supervisor knows exactly how much die work is in the plant tool room. On a large tooling program with a specified completion date, he consults the superintendent and tool room supervisor, to see how much of the work can



STORAGE sections are numbered at top, have seven numbered shelves to spot die locations.



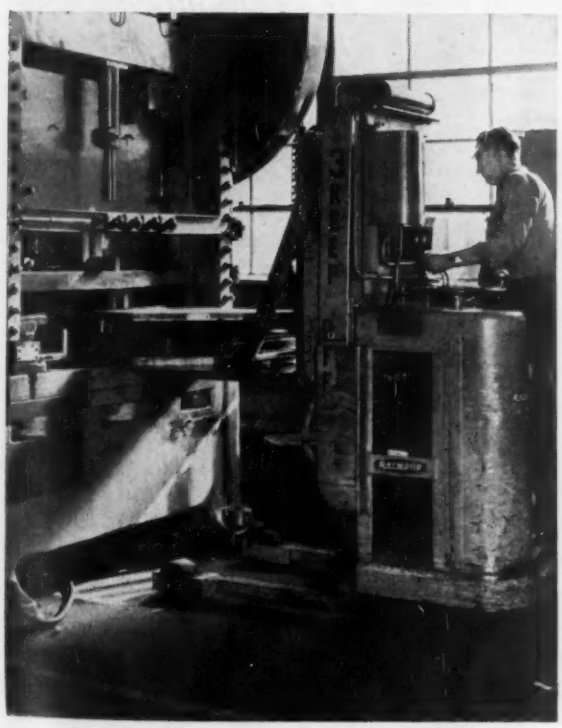
HANDLING tickets tell truck operator exactly which die is wanted, where to deliver it.

be handled by the tool room. The balance of the tooling program is then placed with one or more outside die shops.

Second basic form in the new die control program is the "Temporary or Emergency Die, Tool or Jig Request." Three copies of this red form are filled out by a stamping department supervisor to advise that a temporary or emergency die is needed to complete a specific stamping job.

This form goes first to the plant superintendent for approval or rejection. If approved, the copies are forwarded to the tool design supervisor, who investigates the request. If the die must be made he approves the request, giving the die a temporary number. This is a formal die number prefixed with the word "Temp." The die is assigned a temporary storage space and is entered as a temporary item in the die inventory book. The work order is sent back through the superintendent to show it has been approved and then routed to the tool room supervisor for immediate manufacture of the necessary die.

It is mandatory that any temporary or emergency die be given a coat of red paint before its release to the stamping department. A walk past the die storage shelves will give a fair idea of how many temporary dies there are in the plant at any one time.



SPECIAL push bar on lift truck saves time and effort in loading and positioning heavy dies.

DIE HANDLING ORDER

DEPT._____ DATE_____ TIME DIE REQ'D._____

BRING DIE IN	TAKE DIE OUT
SECTION No._____	
SHELF No._____	
DIE No._____	
MACHINE No._____	
REMARKS:	

POSTED near main aisle, these cards are picked up by the lift truck operator on his rounds.

All approved temporary or emergency die requests are kept in a folder on the tool design supervisor's desk. He glances through it regularly to see if any temporary dies are being held for more than 30 days. If the sales department notifies him that a customer has placed a standing order for the particular stamping, he removes the die from the temporary list. At the same time he issues instructions to make it a permanent die. The tool room then removes the red paint and attaches a permanent number plate to the die.

Third of the basic form in the die control program allows rapid elimination of temporary or obsolete dies. An orange colored "Scrapping and Salvaging Order" was designed to do this. The sales department originates this order often in response to requests from the tool design supervisor to dispose of dies that have not been used for some time.

The sales department may advise holding dies for another 6 months or they may recommend scrapping them immediately. The tool design supervisor initiates the actual scrapping order filling out an orange colored form in duplicate. Customer-owned dies are returned to the customer.

Inventory kept up to date

The scrap order is sent to the tool room supervisor, who orders these dies delivered to the tool room for dismantling. When this is done, he signs his copy of the scrap form. The form returns to the tool design supervisor, who deletes the scrapped dies from the inventory control record and keeps his copy of the scrapping order as a permanent file.

To avoid bulky files, the only permanent records of all the die forms (except for scrapping orders) are kept in the engineering department.

The overall die inventory book is reissued every 4 months. Copies go to the tool design supervisor, the general production manager, and supervisors of each of the stamping departments.

The system has earned the approval of those who are using it. Paper work is minimized.

With low-cost templates—

Electric Eye Guides Continuous Flame-Cutting Action

◆ Flame-cutting equipment guided by an electric eye can cut all parts of one plate thickness for a weldment in one continuous operation . . . Inexpensive templates made of black pressed board are outlined with white pressure-sensitive tape . . . The electric eye automatically follows the line of demarcation between the white and black areas.

◆ This technique eliminates most layout work . . . Templates are easy to store and changes on them can be made quickly . . . More than one set of parts can be cut simultaneously, depending on the number of torches used . . . Use of this method also reduces inventory problems and improves production control.

By H. B. Cary
Divisional Supt.
Marion Power Shovel Co.
Marion, Ohio

◆ CONTINUED CONVERSION to weldments from castings and riveted structures has led the Marion Power Shovel Co., Marion, Ohio, to augment existing flame-cutting equipment with two large Travographs and one stationary machine. These newer machines are guided by electric eyes which automatically follow a line of demarcation between light and dark areas of special templates. The torches follow the identical patterns traced by the electric eye.

By combining all parts of one plate thickness for a weldment on a master template, all the parts can be cut by a continuous or "chain" burning technique. The Travographs were selected because of their large cutting areas. The electronic tracers offer substantial savings in operating costs.

The first chain burning job was on a small bracket designed entirely from ¾-in. thick plate except for two heavy rough-machined bosses. It has only 13 plate items and the completed weldment weighs about 200 lb.

Master templates have a black Masonite base on which the outline is made with a white pressure-sensitive tape. Templates are full size since the torches follow the same pattern as the tracing eye. Though some parts of an assembly may be identical, each piece is laid out on the template. White tie bars or links connect each piece on the template to allow continuous cutting.

In cutting the pieces for the bracket, the plate is first pierced with the tracer located inside the cutout for the base plate. The tracer

is then led manually to the first small triangular piece. The electric eye takes over control of the machine as soon as the spot of light centers over the intersection of the black and white areas.

Without stopping, the machine cuts out eight small triangular shaped pieces and the inside of the base plate, except for the connecting links. The cut is then started on the outer edge of the base plate and continued around the base plate and four large triangular pieces. Thus, two continuous cuts produce all plate items for a weldment. Enough parts can be cut for several weldments by using more than one torch.

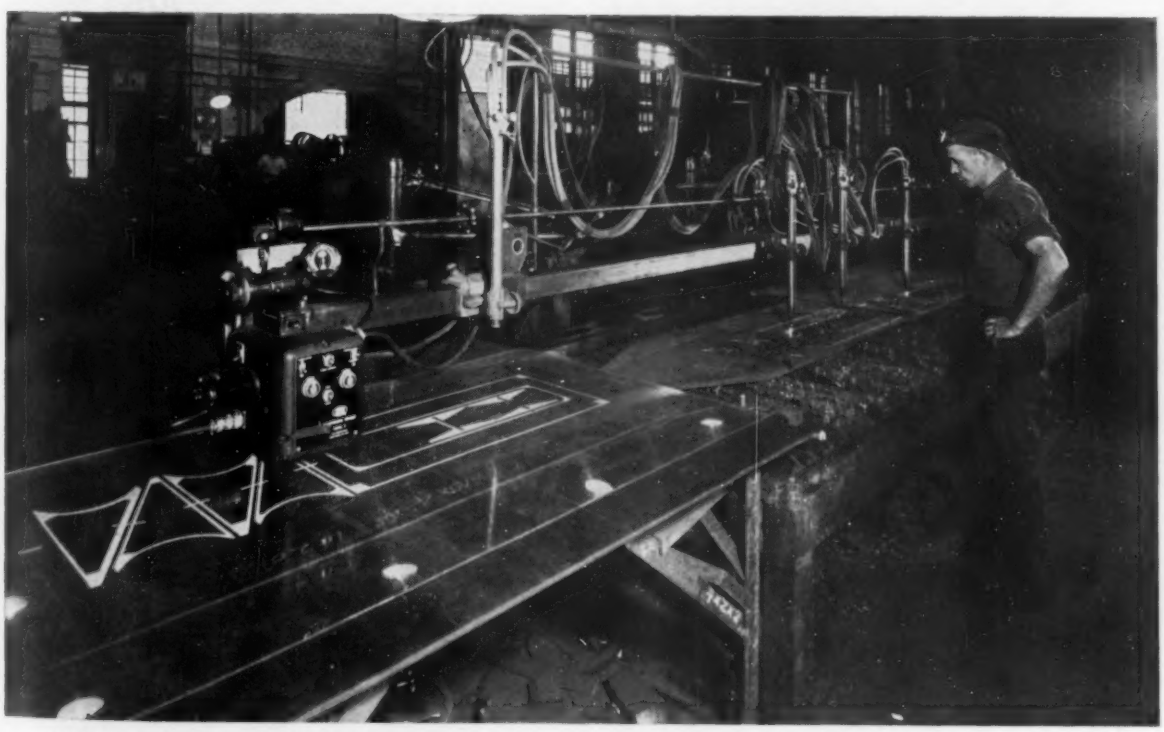
Cutting the tie members to separate the parts is done quickly with a hand torch. Bevels called for on two edges of the large triangular parts are cut in a secondary cutting operation.

The next weldment selected for chain burning was a small gear case and bracket weighing about 350 lb. Originally this case was made from ½, ⅝, ¾ and ⅞-in. thick plate. By reducing the number of plate thicknesses, fewer templates are necessary. Therefore, parts previously requiring ⅝-in. plate were changed to ¾-in. thick, eliminating one template. This resulted in a saving since less plate is handled.

Several other parts in the weldment were made from heavier material. Since aluminum strip templates were on hand for these parts, they were used in conjunction with double carriage flame-cutting machines. Only two ⅞-in. thick parts were used in the weldment, one was made by sawing off a round bar and

HOW CHAIN BURNING REDUCES COSTS

1. Lowers cost of steel plate items for weldments due to:
   Elimination of most hand layouts.
   Automatic cutting is faster.
   Multiple torch cutting can be used.
   Efficient use of steel plate results in more parts and less scrap.
2. Weldments cost less because:
   Better fitup is possible with consistently accurate parts.
   Cycle time is reduced due to elimination of layout.
3. Improves flame cutting flexibility because:
   Cutting intricate shapes, not possible before, can be done automatically.
   Templates can be made quickly and easily.
   Template changes are easy to make.
   Templates are easy to store and maintain.
   Equipment has large cutting area.
4. Indirect savings due to:
   Use of standard size stock plates rather than mill cut extras.
   Elimination of some plate thicknesses which minimizes inventory problems.



ELECTRIC EYE TRACER follows line of demarcation between white and black areas of template. The torches cut identical patterns simultaneously. White links connect parts on the template.

"Time to chain burn was about half the combined layout and semi-automatic cutting time . . ."

the other by a single-part electric eye template.

None of the plate parts for this weldment required beveling. Therefore, all flame cutting was completed after the tie bars were cut. The floor-to-floor time to chain burn was about half the combined layout and semi-automatic cutting time. If two torches were used, the time per set of material would be cut almost in half.

A complete circuit of the tracing head around all parts on the template is not only a cost saving feature but it always produces the required number of parts for a weldment. This provides automatic production control.

Templates for more complicated weldments requiring larger plate items were also made. To economically use the 144-in. cutting width capacity of the machines, the large templates were based on 72-in. wide plates. Since some weldments required wider plates and other weldments did not have sufficient pieces of proper contour to fill a 72-in. width without excessive waste, the requirements were modified to allow 36-in. wide templates for small weldments and templates up to 144 in. wide for large deck plates.

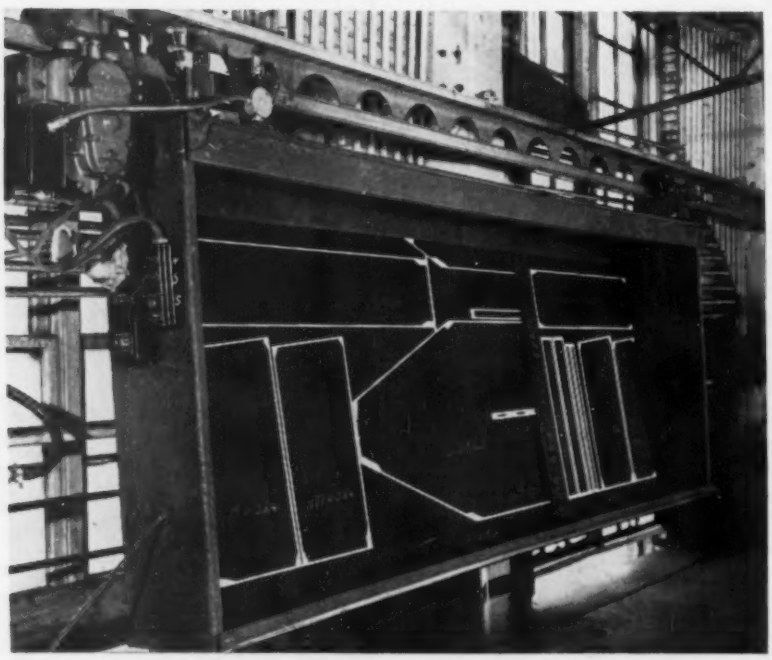
By standardizing on 72-in. universal mill rolled plates 20 and 30 ft long for most requirements, additional savings were possible. Previously, many plates were mill cut to odd dimensions. This not only increased the cost, but limited their use to specific parts.

The Masonite sheets for templates could not be obtained in pieces larger than 4 ft x 12 ft. It was also necessary to allow 4 in. from the edge of a part to the edge of the Masonite for the driving wheel of the tracer. To overcome this problem, one piece 48 in. wide and another 32 in. wide were held together in proper alignment by a special dowel plate.

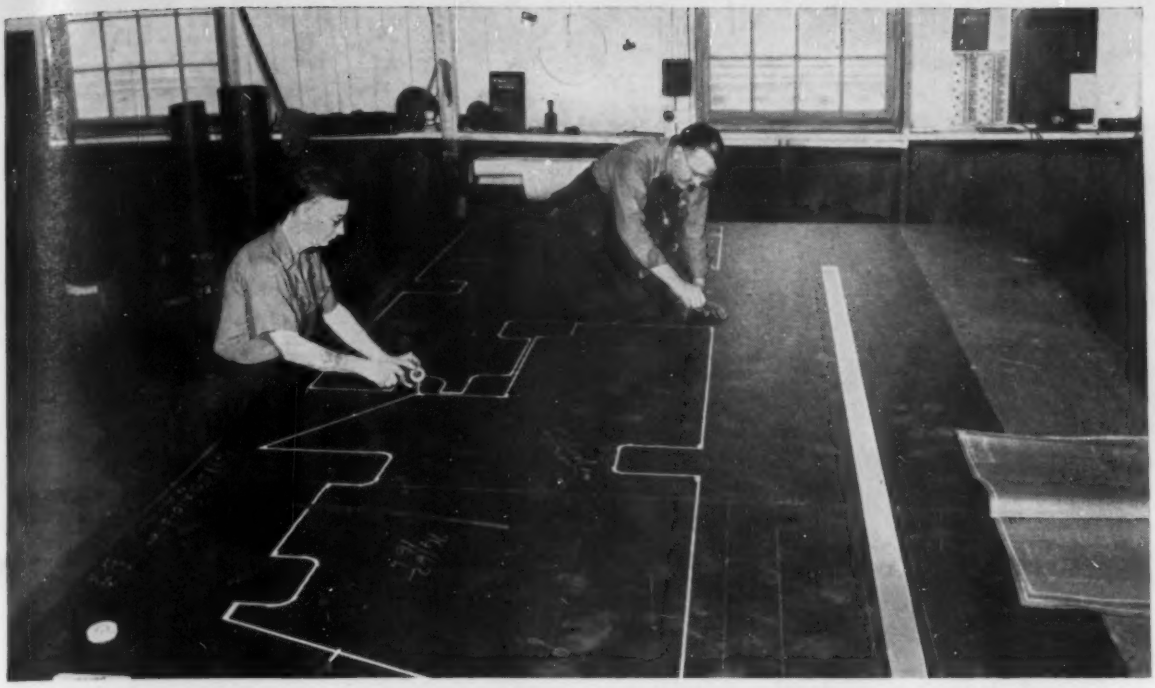
A template is always used for cutting parts from the same plate thickness. Cutting procedure data is on each template. It includes cutting tip size, oxygen and acetylene pressures, and cutting speed. Also included are the template number, material size and specification, and part numbers.

Templates don't deteriorate

Since all cutting is done with one type of tip, the template maker determines the flame-cutting kerf width and makes allowances in his layouts. In addition to the cutting data, the templates usually show the starting point, travel direction, bevel locations and template storage location. The first lot of material cut from a new template is inspected, and if found satisfactory, it is approved by the inspection department and so marked.



TEMPLATE CARRIER on monorail system provides fast transportation for templates between the template - making department and structural department. About 2500 are now being used.



TEMPLATE MAKERS apply white pressure-sensitive tape on master templates to make an outline of the part. Master templates have a black Masonite base. Templates are full size.

In a year and a half, almost 2500 templates have been made. There has been no deterioration of templates during storage, except for minor tape slippage when exposed to excessive heat. Template warpage has not been a problem. Efficient transportation between the template-making department and template table is accomplished by a monorail carrier.

Some unforeseen difficulties were encountered when chain burning was first started. If the size of a part is increased or the geometry changed so that interference occurs between adjoining pieces, it requires shifting several parts. Engineering changes requiring a part to be made of a different thickness means that the part must be removed from one template and added to another.

Warpage causes problems

Warpage during burning had caused many problems. Some parts would go out of square while cutting a multiple-type template. Uneven shrinkage stresses due to heating and cooling caused excessive plastic flow into the tie bars holding the parts together. This was aggravated when the second side of a tie bar was cut and the entire link became red hot. In many cases, this was solved by merely doubling the width of the tie member. In some cases, two tie bars were used. It was also necessary to rearrange the location of tie bars and reroute the tracing path.

Warpage of long, slender pieces cannot be entirely overcome. When the length-to-width ratio becomes too great, it is not practical to cut it on one side and then the other without getting a small amount of camber in the piece.

Another problem deals with nesting large and small pieces together indiscriminately on a large template. In many cases, the smaller pieces tend to become mixed with the cut outs and scrap and become lost. Now the smaller pieces are usually kept together. However, this cannot be carried too far without sacrificing efficient plate utilization.

Tip deterioration during long continuous cuts is another problem. Before starting, tips are carefully checked. If flame trouble develops, the cut is stopped immediately and the tips are cleaned. This is one reason why two operators are assigned to each machine. Another is that waviness occurs in thin plates and in certain alloy plates during cutting. This requires constant torch adjustment for high quality cutting. Plate riders have not been practical to maintain proper tip-to-plate spacing for chain contour cutting.

Preventive maintenance is a must on the tracing and cutting equipment if maximum output is to be maintained. Continuous chain burning for long periods of time and on three shifts squeezes years of normal operation into a few months.

Cleanliness is another important item. Templates, template table and carriage rails must be kept clean for trouble-free operations.

Most template making procedures were worked out during construction of the first few multiple-piece templates. Template makers tried different procedures, then proved them in production. By this practice, standard procedures were adopted.

Cuts processing steps—

Wide Choice in Coiled Strip Leads to Faster Fabrication

Part I

◆ RAPID GROWTH in the use of coiled strip is largely attributed to the many types and finishes that are now obtainable. In addition to regular hot and cold-roiled steel, large amounts of strip are electroplated and lacquered. Among the nonferrous metals and alloys in strip form are aluminum, brass, bronze, copper, Monel, nickel and zinc, plus many specialties.

Cold-rolled spring steels are tailored for particular uses. Cold rolling can be regulated to provide different degrees of hardness. However, if products require greater hardness or higher tensile strength, it is obtained by subsequent hardening and tempering.

COILED STRIP—Part II of this two-part article will appear in the June 10 issue of The Iron Age.

Some strip steels are made to extreme precision in gage. Cold-rolled steel strip ranges in thickness from 0.001 in. upward and in some cases it has been rolled as thin as 0.00012 in.

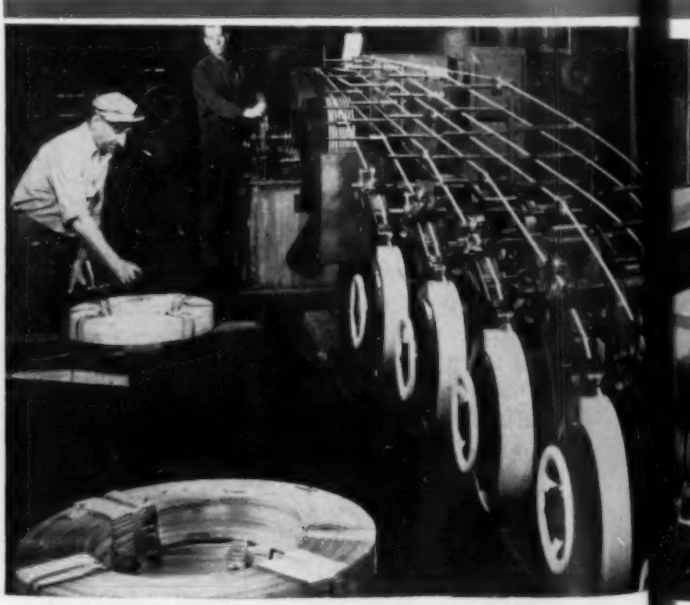
Among the special spring steels are those for metal, wood and meat-cutting bandsaws, each requiring different treatments. Other products include camera shutters, clock and watch springs, surgical instruments, feeler gages, compressor flapper valves, knives, razor blades, shock absorbers, tapes and rules, textile equipment, trowels and a host of other products.

Strip steel can be cold rolled to a specific temper, cold rolled and annealed, or hardened and tempered to specifications, then polished to a bright yellow or blue finish. It may be furnished with square or round edges.

Making strip steel for some vital parts presents many tough problems. For example, the material used for flapper valves and sliding vanes in compressors must meet exacting specifications in each essential property. It must have the proper shape, tolerances, flatness, hardness and elasticity, plus maximum fatigue strength and exceptionally good resistance to wear.

Stainless steel strip in a variety of types is

MR. HYLER brings to The Iron Age more than 20 years' experience in all phases of shop work. His studies and research have given him a broad practical knowledge of manufacturing problems.



OSCILLATING reels coil narrow strip in level wind similar to thread on a spool. In-and-out movement of reels provides leveling action.

♦ Coiled strip in a variety of materials, finishes, thicknesses and widths permits users to eliminate many processing steps, reduce handling and cut down on floor space requirements. . . . Steel strip for special uses is made to desired hardness, tensile strength, shape, flatness, elastic properties and wear resistance.

♦ Bright or satin finishes on steel may be obtained with nickel, copper, chromium or brass as the coating material. . . . Such strip is ready for forming, drawing, bending, spot welding or soldering. . . . Zinc and tin-coated strip resists rusting and provides a good surface for tinning, soldering or further plating. . . . Much of it is painted, enameled or lacquered and can be processed without cracking, peeling or flaking.

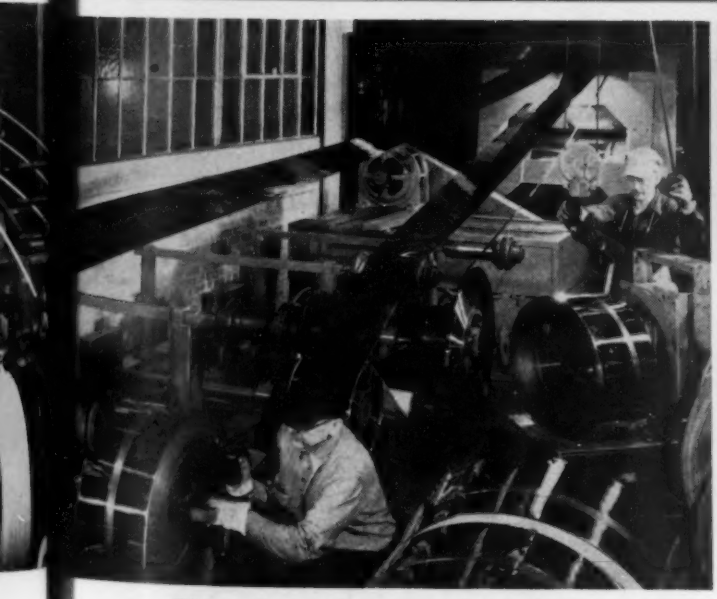
By John E. Hyler
Consultant
John E. Hyler & Associates
Peoria, Ill.

rolled as thin as 0.001 in. in coils up to 16 in. wide. Where desired, it may be obtained fully annealed for maximum workability. It is used for such products as electric shaver guards, wrist watch bands, weather stripping, thermostat parts, conical springs, diaphragms, flexible metal hose and others.

Preplated steel strip in a full range of sizes, gages and tempers is produced with bright and satin finishes, and with different metals including nickel, copper, brass, or chromium. Such strip is ready for stamping, forming, drawing, bending, spot welding or soldering. Steel, electrolytically coated with zinc and Bonderized, is particularly suitable for painted products.

Light-gage steel, aluminum and brass strip, slit to the required width, is enameled to any desired color. The finish withstands the stresses of bending, forming, drawing and fabricating without cracking, chipping or peeling. Moreover, the finish aids stamping and forming operations because of its lubricating effect on the dies. In some cases, strip is pickled and oiled for easier fabrication.

Lead and tin coatings applied to steel by hot dipping withstand as much fabrication as the



GLEAMING STRIP from plating bath is wound on takeup reels and banded for shipment. Finish withstands bending, forming and drawing.

TAKE-UP reels pull lacquered steel strip through roller-coating line. Some coatings successfully withstand punching and blanking.

easy-to-work base metal. The strip can be run through progressive dies and intricate forming rolls without the coating cracking, peeling or flaking. With this coating, the strip can be easily welded, brazed or soldered.

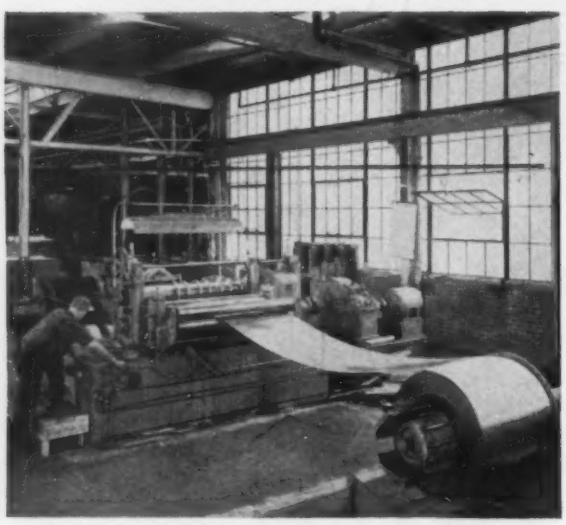
Coatings often serve as a final product finish. In other instances, they provide a good base for further plating or painting. Use of precoated strip speeds processing and reduces costs in many ways. In some cases, eight to ten processing steps have been reduced to two or three and the costs of installing and operating plating equipment are eliminated. Other savings are in materials handling costs and floor space requirements.

A precoating of copper on steel gives an excellent base for further plating. It protects parts from rusting and is helpful in subsequent tinning, soldering and brazing operations. It is also an effective die lubricant, and since strip so coated is of special deep-drawing quality, die life is greatly increased.

Nickel coatings on steel not only retard corrosion and staining, but resist oxidation at elevated temperatures. The properties of nickel-coated strip allow users a wide choice of fabricating methods from simple stamping to deep drawing. With a buffed finish, it serves as an excellent base for further plating, particularly with chromium.

Electrolytically-deposited zinc coatings on steel strip add to the life and appearance of products at low cost. Such strip may be drawn, bent or formed without harming the coating. A natural zinc finish with a Bonderized coating improves adherence for paint, lacquer and enamel. Buffing provides a lustrous finish which can be retained by applying a clear lacquer coating.

Chrome-plated strip is used primarily for decorative applications where a permanent and corrosion-resistant finish is desired. It can be drawn or rolled within certain limits. Its use frequently eliminates costly finishing operations.



CUSTOM SLITTING to extremely narrow widths is done by some mills. In this 48-in. slitting line, a buggy in the floor pit loads the coils.

Can be safely stored

Much of the steel strip produced is painted, lacquered or enameled by roller coating. It does not degrade in storage and can be processed in various ways afterward without difficulty. Some manufacturing firms have developed painting machines which take the strip through progressive baths of cleaning, degreasing, phosphate and chromic acid solutions, then through synthetic enamel.

One advantage of roller coating is that an annular channel may be ground in the coating roller if an uncoated strip of material is desired for spot welding or soldering. Roller coating is also a fast method of applying a coating either to one or both sides of coiled strip. The limiting factor is the speed with which the material can be dried suitably for rewinding.

Where only the top side is being coated, the strip can pass over a number of supports in the oven to prevent excessive sag. If both sides are coated, a special tensioning device must be used to keep the strip from contacting the oven floor. Since the coating speed depends on the drying time, finishing materials are used which require the shortest possible baking cycle. Assuming a 1-min bake, and a 40-ft oven, strip can be processed at 40 fpm.

Where strip is roller coated on a high production basis, processing is continuous. When a coil is almost unwound, the operator quickly uncoils the remainder and spot welds it to a fresh coil. At the outlet end of the oven, the operator at the recoiler equipment often cuts out the spot-welded joints.

Lacquered or enameled strip may be coated with the same color on both sides, or with different colors on each side. Tension applied to material coated on both sides will depend on the weight of the strip and the oven length.

Straddle Carrier Handles 15-Ft Steel Sheets Safely, Easily

♦ ONE OF THE LARGEST sheet-carrying straddle carriers ever built is handling sheet steel up to 15 ft long at United States Steel's new Fairless Works, Fairless, Pa. The machine was specially engineered and built by Clark Equipment Co. to move finished sheet steel from production to temporary storage areas and to collect rejected sheets for subsequent use as crap for the open hearth furnaces.

Finished sheets, wrapped and banded, are handled in unit loads up to a maximum of 30,000 lb. The straddle carrier simply drives over a bundle, the hooks are lowered and tightened against the sides of the load, the load is raised and the machine drives off. At the storage area, the bundle is simply dropped in place. For scrap handling, a 7 ft by 15 ft pallet constructed of angles with steel pipe cross members is used.

Rather than remodel a standard carrier, which could tier sheets up to a maximum length of 10 ft, the special machine was built. This avoided basic modifications in design and construction. It took about 2 years to design, engineer and build a machine that would meet the load requirements efficiently and economically.

On the new machine, each wheel is powered by its own electric motor. A single and a tandem hydraulic pump are coupled to an armature shaft extension. One pump supplies power to a hydraulic motor for steering and hoisting; the other unit drives two hydraulic motors, each furnishing traversing power for one of the two lift hooks.

The straddle carrier handles 100 tons per day without difficulty. The machine is highly maneuverable and easy to handle despite the long and bulky loads, and driver visibility is good.

SOME FACTS ABOUT THE CARRIER

Length	20 ft
Solid tire drive wheels	36 x 16 x 30 in.
Trailer wheels	28 x 10 x 22 in.
Power to wheels	11.9 hp; each wheel has its own motor
Hook length	13 ft
Frame construction	½ in. formed steel plate

SPECIALLY-BUILT straddle carrier handles sheet steel up to 15 ft long and in unit loads up to 30,000 lb. In spite of its size, it handles easily and is highly maneuverable.

To meet design needs—

Show Stars New Materials for Industry

◆ Industry's desire for, and acceptance of, new materials to meet product design and production problems was evident everywhere at the Basic Materials Exposition and Conference . . . Playing top roles were powder metals, plastics, clad metals, ceramics.

◆ Titanium seamless tubing is now being made in sizes to 1.5 in. OD . . . Electroless nickel plating drew attention . . . Lead brick being marketed can easily convert an old safe into a storage area for radioactive materials . . . A new ceramic magnet material has been developed . . . Sintered aluminum powder draws attention.

◆ CLAD METALS, ceramics and plastics played starring roles at the Basic Materials Exposition and Conference held in Chicago, May 17-20. Industry representatives indicated considerable interest in many of the new materials exhibited at the Exposition and described in Conference sessions.

The suggestion of a business pickup was evident to show visitors in the ready approval of new products. Also notable was the rapid development in marketable quantities of new clad metals, new applications of powdered metals and accelerated utilization by industry of new materials. Products development, a weapon in the selling arsenal temporarily put aside during the tight seller's market was strongly in evidence.

In the field of metals, titanium seamless tubing is now made in sizes up to 1.5 in. OD and welded tubing to 1.25 in. OD. Leaded steel with good machinability has replaced parts formerly machined from brass.

Clad metals

Cladding by a process involving fusion and subsequent rolling produces layers as thin as 0.0001 in. Cost of this clad material is reported to be on a par with electroplated material.

Versatility of clad metals is exemplified by a base metal strip coated with silver brazing alloy. The strip is merely placed on the surfaces to be joined and heat applied to the back of the strip. In production, it is used for powdered metal parts, honeycombed structures, electrical contacts, electronic tube assemblies and blind joints.

Chemical plating

Electroless nickel plating is being done on objects ranging in size from tank cars and 20-ft screw conveyors to small screws. The setup has none of the conventional bus bars and anodes. The Kanigen process which deposits a 93 pct nickel alloy and 7 pct phosphorous coating is used on iron, cast iron, steel, stainless steel, copper, brass, bronze and aluminum.

Castings are uniform and have good resistance to alkaline materials and acids. Asplated hardness averages about 49 Rc. Heat treatment to 400° to 500°C will increase hardness to 64 Rc. At 425°C for 6 hr, corrosion resistance is improved appreciably.

Increasing use of Cobalt 60 and x-ray inspection stimulated a great deal of interest in lead brick. Where lack of space prohibits erection of concrete shielding or water tanks, lead brick

will dampen radiation. An old office safe with a lead brick lining can be made into a safe storage area for radioactive materials or a temporary station on the production line.

Ceramics

A new ceramic magnet material, based on the approximate formula $BaFe_{12}O_{19}$, can be pressed or extruded to shape and sintered. The resulting permanent magnet has a coercive force of 1600 oersteds and has high resistance to self-demagnetization.

High alumina ceramics are used as guides in a cold-drawing wire mill. In some instances, their abrasion-resistant properties are equal to those of carbides. The material offers the hardness of carbides at lower cost. Most applications to date have been based on the material's resistance to chemical corrosion and its electrical insulating qualities.

Mica enters jet field

Mica, chiefly regarded as an industrial insulating material, is making a strong bid in the jet engine field. The indication is that a thin, ductile coating can be produced for afterburner linings to resist the 2800° to 3000°F flame. Hot-pressed, homogeneous synthetic mica blocks will stand these temperatures under test. Sheet or flakes are now made in widths up to 4 in.

In plastics, wider acceptance in the use of a polymer, which is chemically inert, has resulted in price reductions ranging from 22 to 42 pct. The material also has excellent electrical properties, a high temperature range and zero moisture absorption.

Expanded use for this material has been found primarily in the chemical and electronics industries for tubing gaskets, vessel linings, tube socket, wire and cable insulation and a number of other products.

Powdered metals

Capabilities of powdered metals as a basic metalworking material are continuing to expand rapidly, H. H. Hausner, Sylvania Electric Products, reported to the conference. The SAP (sintered aluminum powder) process offers tensile strengths to 50,000 psi at room temperatures. At 400°F the material has a tensile strength of 35,000 psi, and at 600°F offers a strength of 25,000 psi.

Oxidized aluminum powder is compacted at 25 to 50 psi at 500° to 600°F and is then hot-pressed at the same temperatures, and finally extruded to the desired shapes. During hot pressing and extrusion the oxide skins are distributed about the aluminum grain boundaries.

Compacting and sintering of metal hydrides is expanding in usage. Zirconium hydrides,

EVERYTHING from nonmetallic magnets to wood that is tougher than bronze gets scrutinized carefully by about 10,000 designers, engineers and businessmen at Chicago's Amphitheater.

"Iron products, powdered metals and foundry equipment are moving more rapidly . . . Electronics industry is boosting orders . . ."

sintered in a vacuum, readily decompose to pure metal with full density at temperatures of about 65° below the zirconium melting temperature. In this case, the zirconium hydride gives better sintering results at a lower temperature.

Sinter welding is used increasingly in joining powder metal parts. A compound of the same powdered metal is placed between the two parts to be joined and they are hot-pressed together. The powder between the two parts decomposes, forming a bond. Zirconium parts bonded by zirconium-hydride powder showed the joint to be of practically the same grain structure as the parts.

Plastic bonding

Use of plastic bonding in connection with rivets in making wing panels and pressurized tanks was described in a paper by George Epstein, North American Aviation, Inc. Other uses include fastening of brake linings to brake shoes. And, in at least one case, plastic bonding has been used with some success where operating temperatures reached 500° to 600°F.

While the use of bonding adhesives is not new in the aircraft industry (Sikorsky helicopter rotor blades were produced in 1944 with a plastic bond) industry has not generally been cognizant of the advantages in fatigue reduction possible in joining metal surfaces with a plastic bond. The aircraft experimentation both here and abroad, while incorporating the study of fatigue, was also deeply concerned with the possible weight savings.

New uses for glass

Though plastics have been moving into fields that were once the exclusive domain of glass containers (industrial carboys, for example) it would appear that glass in new forms is offering a variety of new uses. Besides molds, there's a miniature tube socket in glass that is now under test. A new transparent enclosure, a metal-glass unit that will form a hermetically sealed envelope around an electrical relay is impervious to moisture, oil and chemical fumes.

A Look At Materials Market Conditions

Iron products gain

***Iron products, powdered metal and foundry equipment are moving more rapidly after a slow start at the turn of the year.**

*** Television, struggling with color problems since late '53, is reported to be pushing a little harder for components.**

Back in market

*** The electronics industry, after a slow first quarter, is now boosting orders for many raw materials by appreciable margins.**

*** One materials supplier to TV manufacturers will beat last year's sales dollar volume for the first 5 months, but the big gain was earned in the last 45 days. Another supplier is holding last year's dollar volume despite a drop in defense work.**

*** Aircraft, viewed cautiously by industrialists since the cutbacks and stretchouts of mid-1953, is purchasing more strongly.**

Stainless holds even

*** Demands for stainless steels have shown some gains but the market picture is still somewhat mixed. Wider use in the dairy industry and for ornamentation are helping sales hold a fairly even keel.**

Copper, aluminum move up

***Domestic deliveries of refined copper showed a recent and sizable increase. With production having been lowered, the net result was a slight cut in the stockpile.**

*** Sales of aluminum products to consumers for the first quarter went above those of last year. Some companies are attributing their increased sales volume to new products and new applications for old products.**

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FREE Technical Literature

Wheel forming

Bulletin describes new Pratt & Whitney medium sized Diaform which simplifies the form-truing of complex and irregular shapes up to 2 in. wide and 1 in. deep on any wheel from the smallest up to 14 in. diam and insures the re-truing of a formed shape as often as required. Illustrations, specifications and technical data are included. *Pratt & Whitney.*

For free copy circle No. 1 on postcard, p. 137.

Grinding & finishing

New booklet gives uses of coated abrasives for grinding and finishing nonferrous metals. It points out that using coated abrasive belts and discs for removing nibs, risers, burrs or flashings from nonferrous castings results in consistently better finishes, increased production and lower unit costs, with greater safety and less fatigue for operator. Another feature of publication shows use of coated abrasives in finishing of patterns, molds and dies. *Minnesota Mining & Mfg. Co.*

For free copy circle No. 2 on postcard, p. 137.

Tools

Illustrations, specifications and dimensions are given for Zagar tools in new catalog. Included are drill head parts, broaching equipment, collets and collet fixtures. Zagar Tool has confined its broaching equipment to the machining of medium and small parts. Simplified construction helps to reduce cost and make a sizable plant inventory possible, thus filling customer's needs with greater dispatch. *Zagar Tool, Inc.*

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FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 137.

Furnace bottoms

Booklet of ideas and suggestions on how to resurface your open-hearth furnace bottom more economically with Permanente 165 is now available. Company experience shows that openhearth furnaces can be shaped up for resurfacing in from 5 to 10 hours after last heat is tapped. Permanente 165 Periclase Ramming Mix is uniquely suited for cold resurfacing. *Chemical Div., Kaiser Aluminum & Chemical Sales, Inc.*

For free copy circle No. 4 on postcard, p. 137.

Press brake

Brochure describes Di-Arco Press brake which has been designed to perform many duplicating operations required for short run jobs that cannot be satisfactorily or economically performed with leaf style folding brakes or other types of metal working machines. Versatile press brake is especially valuable in model shops, experimental laboratories and production departments where a limited quantity of parts must be accurately produced. *O'Neil-Irwin Mfg. Co.*

For free copy circle No. 5 on postcard, p. 137.

Rotary machine

Brochure describes Medart 2-Roll rotarys which straighten hooked or cambered ends on bars and tubes. The modified straight roll deflects workpiece against a concave roll subjecting it to a tremendous number of straightening cycles per foot which assures precision straightening and sizing end to end. *Medart Co.*

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Got a Perforating Problem?
See Hendrick for the solution!

Sometimes the quickest, surest answer to design problems is very simple. In numerous cases, the inclusion of a pleasing pattern of perforations is just what is needed to make products more attractive and saleable. And whatever material you're using—be it metal, masonite, rubber, plastic, hard or insulated board for decorative display or fabricating purposes, Hendrick can help you.

For many years Hendrick has been building up the largest stock of dies commercially available. If you are faced with the need for bringing newer, more modern design elements into your products, Hendrick's long experience and perforating facilities can be yours for the asking. Write for more information, today.

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Leaded alloys

Factual new case history proof of how new leaded alloys can help you in cutting costs, meeting price competition, and satisfying demands of cost-conscious customers is presented in colorful illustrated booklet. Listed are nine major advantages to be gained by using the new leaded alloys over non-leaded types. Five illustrated case histories on a variety of simple and intricate machined parts reveal that leaded alloys boosted production 33 pct and more. *A. M. Castle & Co.*

For free copy circle No. 7 on postcard, p. 137.

Hydraulic tracer

New Axelson Trace-O-Matic Hydraulic Tracer attachment converts Axelson's general purpose lathe into contouring production machines. Exceptional cost reduction over former methods and the ability of the lathe to handle a variety of work economically are special features of Trace-O-Matic. Initial installation is but a matter of a few hours and reverting to a standard lathe takes only 15 min. Unit is built ruggedly and does not restrict the swing or capacity of the lathe. *Axelson Mfg. Co. Div., Pressed Steel Car Co., Inc.*

For free copy circle No. 8 on postcard, p. 137.

Balancing machines

Brochures feature information on under-drive balancing machines, design of balancing equipment for special purposes and single-plane balancers. Under-drive balancer is a specialized adaptation of the Model S Annis Dynograph Balancer, designed for the rapid production balancing of rotating assemblies such as the motor-blower wheel assembly. Single-plane balancers are designed to balance impellers, flywheels, blowers, fans, clutches and other similar rotating parts which cannot be satisfactorily balanced by usual standing static method. *R. B. Annis Co.*

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Turn Page

Ransburg Electrostatic Processes

Whether it be painting of automobile bodies —(in one case, saving $1.81 per body)—or painting smaller automotive parts, RANSBURG ELECTROSTATIC PROCESSES are accounting for substantial savings to the manufacturer, and to the buying public. *An accumulated savings amounting to several dollars per car!*

In various plants here and abroad, industry is relying upon the unmatched efficiencies of the Ransburg Electrostatic Processes to paint these automotive parts:

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AIR FILTERS • OIL FILTERS • SHOCK ABSORBERS • RADIOS • HARDWARE
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DRY BATTERY PARTS • BUMPER BRACKETS • CONVERTIBLE TOP PARTS
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...to better your GRINDING operation. Investigate Electro "SPECIFIC PURPOSE" resin or vitrified GRINDING WHEELS
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Electro Refractories & Abrasives

Free Technical Literature

Continued

Pumps

Features and specification data on De Laval type General Service pump is listed in new bulletin. De Laval G. S. centrifugal pump is designed for easy maintenance and service. It can be ordered from stock for immediate delivery and all parts are standardized and interchangeable. New bulletin illustrates ease of maintenance and service features of De Laval G. S. pumps including the rotor assembly which contains all working parts and which lifts out of the casing as a single unit. Other features are the mechanical seal and life-time lubricated bearings. *De Laval Steam Turbine Co.*

For free copy circle No. 10 on postcard, p. 137.

Control valves

New 4-p. bulletin gives data on Vickers Microfeed flow control valves for machine tool and welding machine oil hydraulic systems. Flow control circuits, performance curves, installation data and complete specification tables are given. Gasket-mounted valves in a series of models for ¼, ⅜, ¾ and 1¼ in. standard pipe sizes are described, which provide adjustable metered flow capacities from 5 cu in. per min to 65 gal per min. *Vickers, Inc.*

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Drilling

New bulletin shows in detail the improved Model M.S. Motor Spindle Drilling and Tapping Machines. These high speed ball-bearing drilling and tapping machines are made in Model 2 M.S. for general production and tool room use and in Model 4 M.S. for heavy work. Bulletin illustrates flexibility of models and shows many of the combination arrangements possible, using Edlund attachments, to adapt the machine to meet specific production requirements. Concise tables provide pertinent engineering data and machine specifications. *Edlund Machinery Co.*

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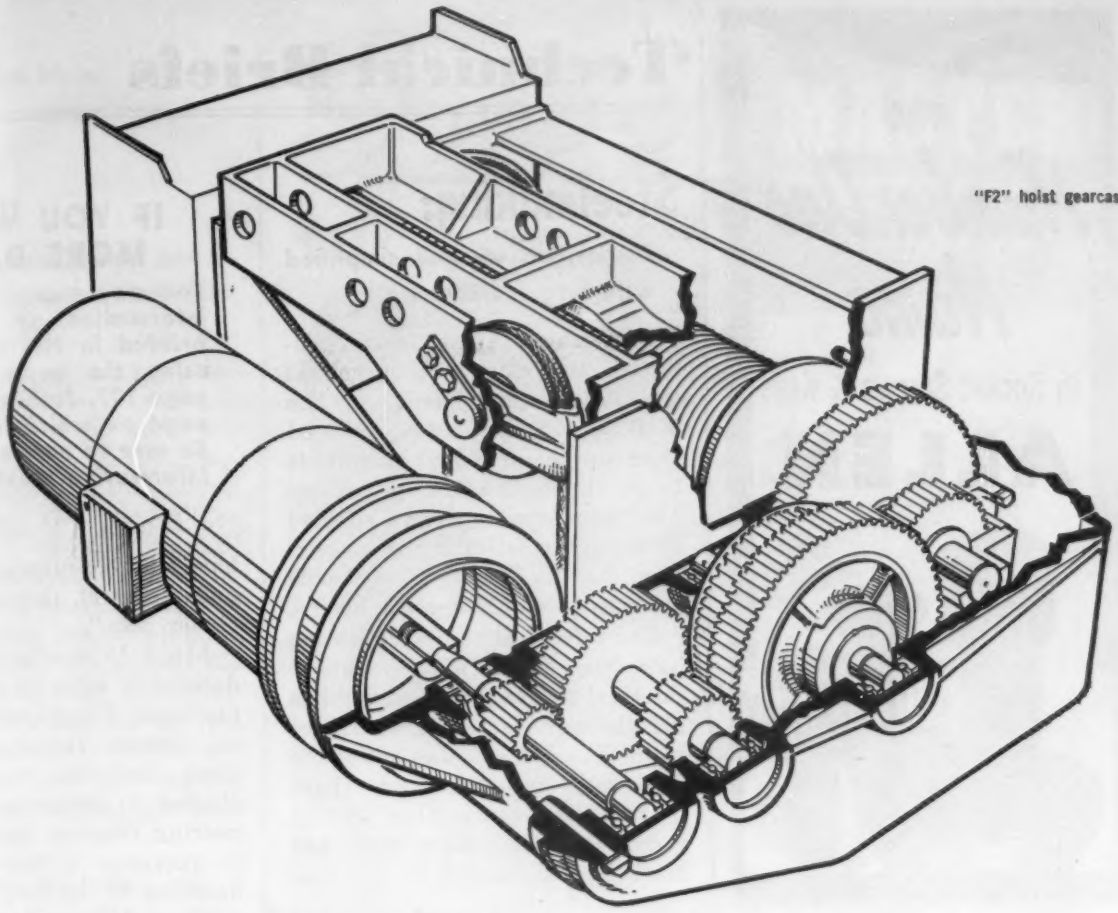

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Result—the *F* hoist—the hoist with guts for today's competitive pace—the hoist that carries full loads all day—day after day, month after month. Long years after you've written it off, your *F* hoist will be pulling for you. *Capacities:* 1,000 to 20,000 lbs. *Hoist Speeds:* From 10 to 54 f.p.m. *Standard Lift:* From 16 to 40 feet. *Control:* Push button or Pendent Rope. *Mounting:* Lug, push or hand geared trolleys, or choice of long or short radius powered trolleys.

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Technical Briefs

Steelmaking:

Disposition of slag simplified with larger cinder pot.

Disposing of slag from openhearth and electric furnaces at the Philadelphia plant of The Midvale Co. has been reduced from a problem of first magnitude to a simple routine procedure. The transformation was effected by merely substituting large cast steel 250-ft capacity cinder pots for small 25-cu. ft. steel basins.

The effects of this substitution have been keenly felt throughout the steel plant. Housekeeping has greatly improved. Slag no longer spills over and splashes out of the containers onto the floor. There is far less transporting of the large slag-filled containers and much less spillage.

Cranes Freed

Further, the single overhead crane, which was previously tied up lifting and moving the slag basins, is now freed for the more important jobs of servicing the furnaces.

"We have the Mackintosh-Hemphill corrugated cinder pots in almost constant use," says S. A. Ott, openhearth superintendent. They are busy 24-hours a day, five days a week. We think we have our slag disposal system now under control, thanks to the new cinder pots."

Big cinder pots used . . .

About 18 months ago, Midvale decided to solve its slag handling problems. The physical plant setup, furnace capacities, and handling facilities were carefully studied to determine what engineering changes had to be made to guarantee a more expeditious handling of the slag.

Three 100-ton openhearth furnaces and two 15-ton and one 50-ton electric furnaces had to be serviced.

Haul Slag Away

Midvale is in a rather unique position of having to dispose of all its slag outside the plant premises. There is no slag dump on the Midvale property, situated as it is in the center of Philadelphia. All slag has to be cooled at the plant, and then hauled away in railroad hopper cars. Consequently, part of the problem was to expedite the cooling of the slag.

Bearing these problems in mind, Midvale engineers purchased a battery of large 250-cu ft capacity Johnston cinder pots from Mackintosh-Hemphill Co., Pittsburgh. The corrugated walls of these cinder pots permit very fast heat dissipation and quick cooling of molten slag. Only a few hours after entering the pot at around 2900°F temperature, the slag cools and solidifies.

The new cast steel Johnston pots have seven to ten times greater capacity than the steel basins now removed from slag disposal service.

IF YOU WANT MORE DATA

You may secure additional information on any item briefed in this section by using the reply card on page 137. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

Painting:

Hot spray application improves finish, saves materials:

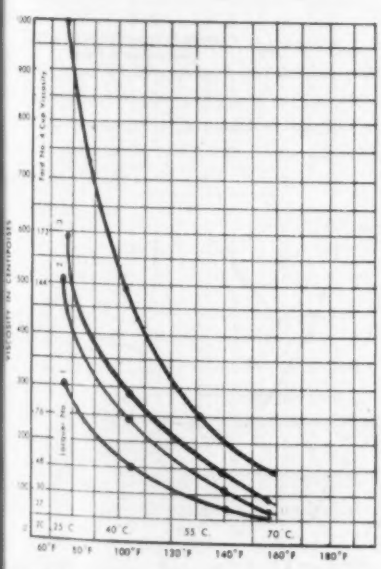
Better finishes, fewer rejects, and use of less material in many finishing applications is claimed possible through use of hot spray finishing, according to L. F. Long, Technical Service Director, Central Industrial Div., The Glidden Co., Cleveland.

Heating of sprayed finishing materials was tried before World War II but due to the lack of adequate heating equipment the process did not attain wide-spread use. Now there is a wide variety of this equipment available to the finisher and many advantages over the cold methods can be gained by their use.

Three Methods

In general, three types of hot spray application techniques are employed; (1) air atomization of heated paint, (2) airless hot spray, and (3) steam spraying. All have a number of common features.

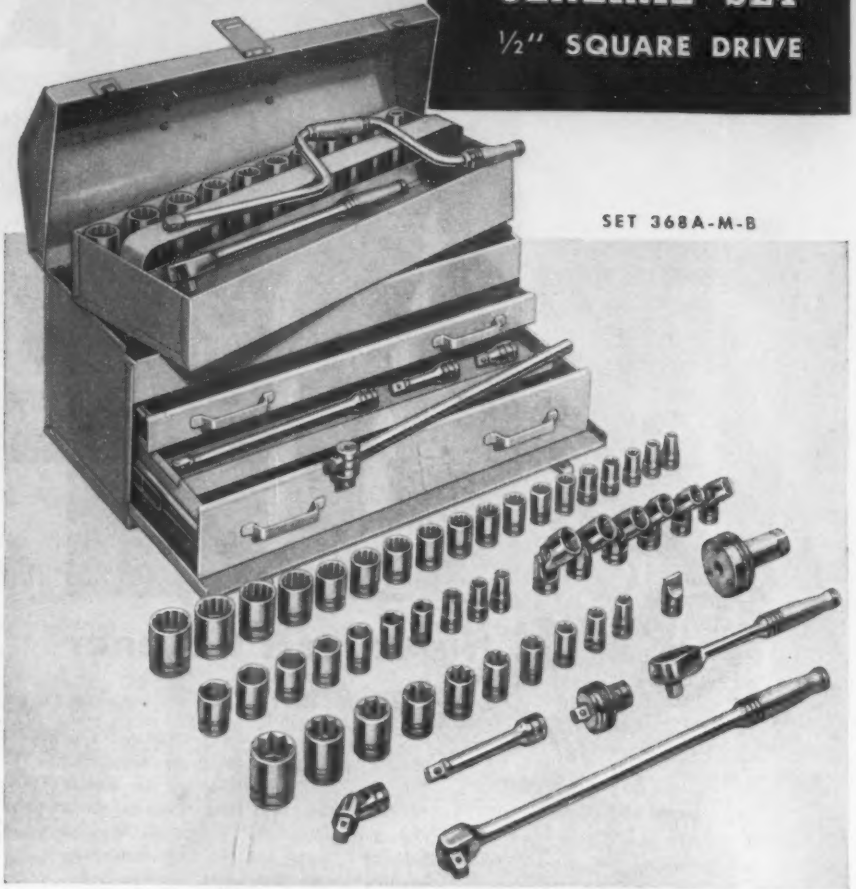
The hot spray process is based on the broad generalization that organic finishing materials exhibit



DECREASE in viscosity of several nitrocellulose lacquers as temperature is raised from 25° to 70°C.

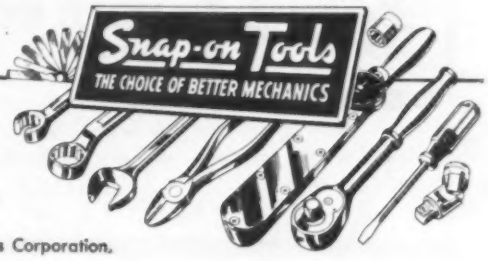
Turn Page

Snap-on* MASTER
GENERAL SET
½" SQUARE DRIVE



—covers widest range of wrench operations

By far the widest range of nut turning operations, in both production and maintenance, are covered with this Master Wrench set—½" drive, wrench sizes from ⅜" to 1¼". With this set your men have at their finger tips every combination of handle, adaptor, extension and socket to speed any job in this wrench size. On job after job you get the pay-off of Snap-on's superior speed, flexibility, durability. The sturdy Mechanikit chest has tote-tray and drawers for orderly tool arrangement and safekeeping. Available through your nearby Snap-on branch. For Snap-on industrial catalog and 104-page general catalog of hand and bench tools, write—



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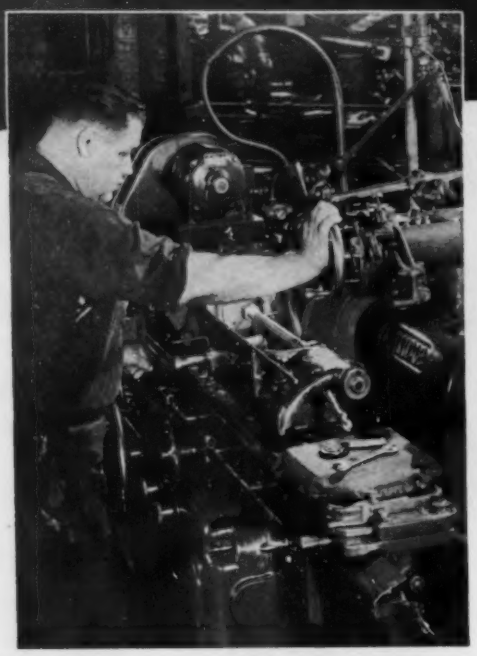
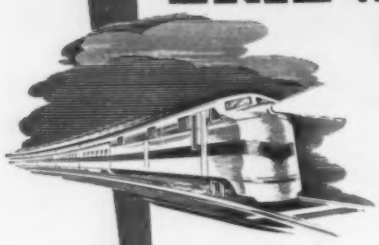


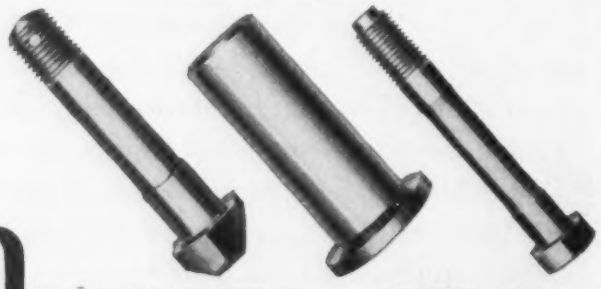
ERIE the correct fastener for the job!



Erie Fasteners are in wide use by the nation's leading builders of Railroad Equipment.

You can rely on over 40 years of experience in producing bolts, studs and nuts designed to withstand the effects of high and low temperatures, high stresses, fatigue and corrosion. Modern facilities enable our skilled craftsmen to produce to your specifications bolts, studs and nuts, precision machined and heat treated in carbon, alloy, stainless steel and non ferrous metals.

These Erie Products prove their quality every day in the railroad, chemical, petroleum and automotive industries; on farm, construction and industrial equipment and heavy machinery. Send your design and material specifications to us . . . we will make for you the Correct Fastener for the Job.



A SUBSIDIARY OF Barium STEEL CORPORATION

ERIE BOLT and NUT CO.

ERIE • PENNSYLVANIA

STUDS • BOLTS • NUTS
ALLOYS • STAINLESS
CARBON • BRONZE

Representatives in Principal Cities.

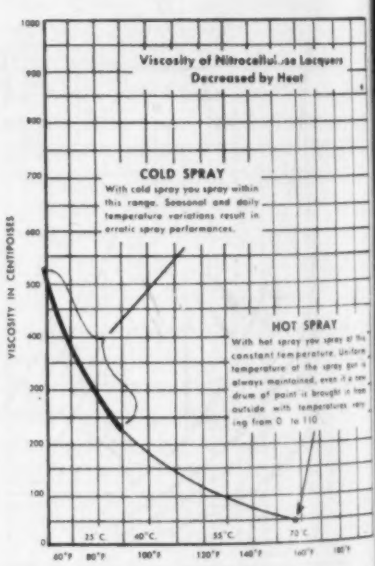
Better control of lacquers is an important feature of the process . . .

a decrease in viscosity as their temperature is increased. It is possible to use heat in place of all or a part of the thinner ordinarily added to reduce the consistency of paint for proper atomization in spraying. This is the concept upon which all hot spray application is based.

Uniformity Improved

The most important feature of hot spray, is the substitution of a uniform, easily controlled fluid paint temperature (usually within 120° to 160° F range for lacquers; 140° to 180° F range for synthetics) for the highly variable room temperature of conventional cold spray.

This makes it possible to more easily and accurately control coating viscosities, solids, atomizing pressures, and fluid delivery. Better uniformity of the finished work results. "Room temperature" can, and many times does, mean anything from 55° to 60° F in a cold winter-time shop to 100° F plus in summer. This is an important fea-


Viscosity of Nitrocellulose Lacquers Decreased by Heat
COLD SPRAY
With cold spray you spray within this range. Seasonal and daily temperature variations result in erratic spray performances.
HOT SPRAY
VISCOSITY IN CENTIPOISES
25°C
40°C
55°C
70°C

COMPARISON of viscosities between cold spray and hot spray. Uniform temperature is maintained at spray gun.

Turn Page

Borg-Warner speeds staking job 36%

with a 75-ton MULTIPRESS®

Safer operation, fewer rejects and other production gains reported at Mechanics Universal Joint Division, Rockford, Illinois

In this operation, a flat steel disc 3/32" thick is inserted by hand in a steel sleeve used in an automotive universal joint. The disc rests on a shoulder formed where the inside diameter of the sleeve changes abruptly to a smaller dimension.

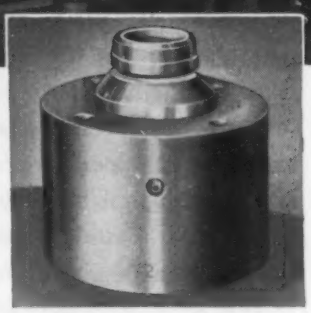
The sleeve is internally machined, leaving a small, continuous lip of metal just above the edges of the correctly seated disc. With gentle, smooth staking effort, the Multipress ram tooling forces this lip solidly against the edges of the disc. It is a precision operation, as the disc must separate the two different I.D. areas with a permanent oil-tight seal.

The 75-ton Multipress, equipped with a six-station Denison Index Table, is set for continuous cycling. The ram reverses automatically when preset pressure is reached.

The operator simply places the parts in the table fixtures, with the discs properly in place. The parts are then indexed automatically under the ram, and the oil seal is firmly staked in place. At the second index position past the ram, the operator removes the staked assemblies.

In addition to a 36 per cent production gain, Multipress does the job with closer uniformity. Scrap has been reduced to the vanishing point, die life increased, and labor costs cut. The same Multipress brings similar savings on 21 different operations at this plant.

In the thick-walled steel sleeve both outside and inside diameters are larger at one end. A disc-shaped oil seal separates the different-sized areas.



The sleeves, with oil-seal discs in place, are simply placed in fixtures at each of six Index Table stations, permitting continuous loading and unloading.

DENISON HydrOlics

PUMPS | MOTORS | CONTROLS | PRESSES

Multipress offers a wide range of bench and floor models, in capacities from one-ton to 75 tons. Manual, footpedal, push-button and automatic controls are available, for single or sequence operations. Dual safety controls and the servo-type Multipress Touch Control are also available. Six-station and 12-station Indexing Tables and many other standard Multipress attachments provide many additional production-speeding advantages. Write for the illustrated story, "MULTIPRESS — and how YOU can use it" . . . there's no obligation.

THE DENISON ENGINEERING COMPANY, 1158 Dublin Rd., COLUMBUS 16, OHIO

ARCOS FOR FINEST QUALITY WELDS

Submerged Arc Welding of Stainless with **new** Arcosite Flux

Now, for the first time, you can apply the economy of submerged arc welding to stainless steels. No longer need you worry about cracking, or poor transfer of the essential stainless elements. The combination of *new* ARCOSITE FLUX and *new* ARCOS CHROMAR (Stainless Steel) WIRE provides a balanced analysis for sound, dependable welds on every job. It's another example of how Arcos experience with coated electrodes and weld metallurgy is being translated into tangible benefits for you.

Write today for the Arcosite Flux Bulletin and see how you may profit from these two *new* Arcos products. Arcos Corporation, 1500 South 50th Street, Philadelphia 43, Pennsylvania.

WELD WITH ARCOS

STAINLESS WIRE AND ARCOSITE FLUX

—Technical Briefs—

It is possible to spray a synthetic enamel without thinning by heating . . .

ture of this controlled application.

Since less solvent is needed in hot spray, application of a higher solids material is possible. For instance, it is possible to spray a synthetic enamel without reduction by heating it to 160° F. The same enamel would require thinning in the ratio of 5 parts of enamel to 1 of thinner if sprayed cold at 75° F. Thus, only 5/6 of the original nonvolatile content has been applied by cold spray when equal quantities are sprayed.

Dry Film Thicker

The practical result of this is that a greater dry film thickness ordinarily can be obtained under like conditions. This sometimes makes it possible to obtain a required film thickness in fewer coats or passes. On the other hand, where a thin film is all that is required, this can be a drawback unless carefully controlled, resulting in application of a thicker film than is required and actually increasing paint consumption.

Flow Improved

Reduction of thinner consumption and consequent savings is also possible with hot spray. In many cases, such as with lacquer, however, the thinner cost saving is at least partially offset by increased cost per gallon of the higher solids hot spray lacquer.

Savings in overspray are often thought of as an advantage of hot spray. It must be remembered that this results only from a reduction in atomizing pressures (in the case of air atomization). This is possible only if the particular finishing material can be hot sprayed satisfactorily at a lower viscosity than the lowest practical cold spray viscosity.

Less Tendency to Sag

In many instances with hot spray it is possible, with proper formulation, to obtain better flow-out and less tendency to sag, thus improving product appearance and

reducing rejects. If it is established that fewer coats are needed with hot spray to obtain the desired film thickness than with cold spray, then saving in time and labor can result.

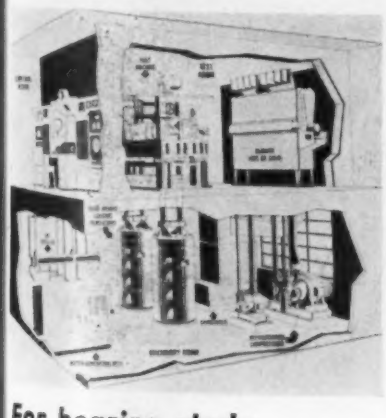
In general, hot spray application requires specifically formulated materials to take full advantage of its features. This is essential where lacquer is concerned. Although most synthetics can be satisfactorily hot sprayed by simple manipulation of the reducing solvent, it is often possible to improve performance by reformulation. In some cases it is mandatory.

Research:

Journal bearing performance studied in special room.

Higher speeds and heavier loads have increased the number of hot boxes in freight car service in recent years. This has placed increased emphasis on the need for basic study of hot-box problems. Performance under many conditions will be studied in a new bearing laboratory research center recently set up by American Brake Shoe Co. at Mahwah, N. J.

Special efforts have been taken to maintain correct temperatures within the laboratory. A Worthington refrigeration compressor driven by a 40 hp motor is used for obtaining large temperature drops in the test room and for holding it at very low temperatures. A smaller compressor, driven by a 5 hp motor, is used for minor adjustments in temperature, and for



For bearing study . . .

Turn Page

ARCOS FOR FINEST QUALITY WELDS

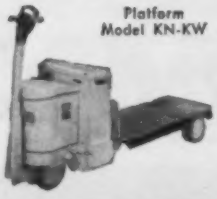
Mountains crumble as ***welded*** *jaws bite in*

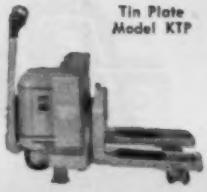
Modern power shovels gulp truckloads of rock and dirt at one bite. It's a good example of how *welded* high tensile steels make possible bigger payloads—provide extra strength and toughness to reduce maintenance.

An important factor in this achievement is the quality of weld metal. That's why so many fabricators today specify Arcos Low Hydrogen Electrodes when welding low alloy high tensile steels. *On any job* demanding shock and abrasion resistance . . . maximum strength and ductility, the excellent properties of Arcos weld metal assures the results you want in service. Arcos offers quality weld metal and technical assistance that is second to none. Arcos Corporation, 1500 South 50th Street, Philadelphia 43, Pa.

WELD WITH ARCOS LOW HYDROGEN ELECTRODES

Tractor Model KT


Platform Model KN-KW


Tin Plate Model KTP

High Lift—Model KHL

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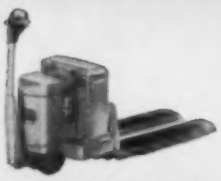
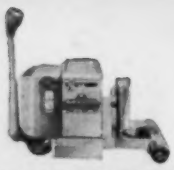
Look over the models illustrated. Some one of these trucks is adaptable to your needs. Whether you want to pull—push—carry or lift there is a model for every possible use. The many fleets of HYDROLECTRICS today carry products of every kind, shape and description are convincing evidence of their unusual application.

Write today for FREE Catalog No. 35 featuring complete line of Lift Trucks.

Ridertractor—Model KTR


Pallet—Model KPN-KPW


Tongue Lift—Model KTL

LIFT TRUCKS INCORPORATED

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CINCINNATI 14, OHIO

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And to smart gear users this CINTI is a sign of *good* gears.

CINTI "Gears... Good Gears Only"

THE CINCINNATI GEAR CO. • CINCINNATI 27, OHIO

—Technical Briefs—

holding at values slightly below outside room temperature.

Temperature Control

Any temperature setting made is automatically maintained in the test room through controls on the refrigeration system and the heating system. The controls, in turn, depend on information supplied by thermocouples located throughout the test room.

All of the equipment in the test room and the machinery room is controlled at the operators panel in a separate control room where the operator looks directly into the test room through a thermopane window.

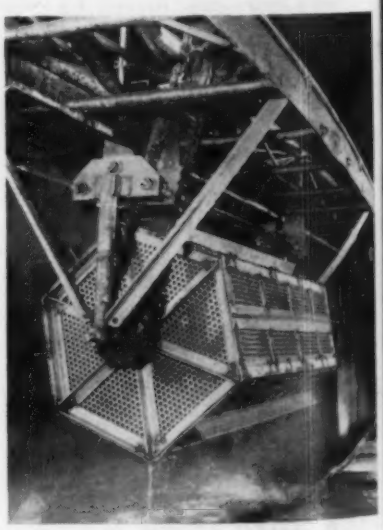
A system of weights can exert simulated loads up to 20,000 lb per journal. A hydraulic loading arrangement permits applying as much as 40,000 pounds to the journal bearing.

Plating:

Portable tumbler cuts costs at aircraft factory.

Small aluminum parts are Alodine-plated inside a power-driven tumbler at Temco Aircraft Corp. Recently introduced at the Dallas, Tex., factory, the portable tumbler has shaved 8 man-hours per shift off time required for plating.

Small parts formerly were arranged in wire baskets for their 2 to 3-minute dip in the corrosion-



Powered plating tumbler...

Tumbler speeds plating of many parts . . .

resistant solution. Parts were carefully spaced so that no two would become moisture-sealed and all surfaces would get full exposure to the Alodine bath. This painstaking job was a full-time task for at least one man per shift.

Cage Speeds Plating

By keeping parts and solution in motion, it insures thorough bathing of all surfaces. The squirrel cage speeds plating, and it further removed workers from possible contact with irritating Alodine solution.

Tumbler shape is hexagonal and its walls are made of 16 gage stainless steel, perforated throughout with ½-inch-diameter holes in staggered pattern. Length is 4 ft, 3½ in. Width is 2 ft, 2 in., and each of the tumbler's six flat sides is 1 ft, 3 in. in width.

Inside the tumbler, three perforated partitions are secured by stainless steel angles. Partitions permit segregation of four different varieties of parts, or they can be removed to admit parts up to 4 ft in length.

Fins Act As Stiffeners

A stainless steel flange runs from end to end on each outside face of the hexagon. These fins act as stiffeners and as agitators to keep the plating solution in motion.

The tumbler revolves on two ⅞ in. diam pivot rods, one of which is inserted in a 14-tooth sprocket.

Sprocket and tumbler are revolved by a 1.506-pitch metal roller chain, driven by a ½-hp Boston ratio motor to which a 7-tooth sprocket is attached. Motor mount consists of three cast iron bars, each 6 feet long. The tumbler is suspended from the motor mount, and the mount itself is attached to an overhead crane rack.

Close With Hinge Pins

From the time parts are loaded into the tumbler and the tumbler door is closed with hinge pins, the

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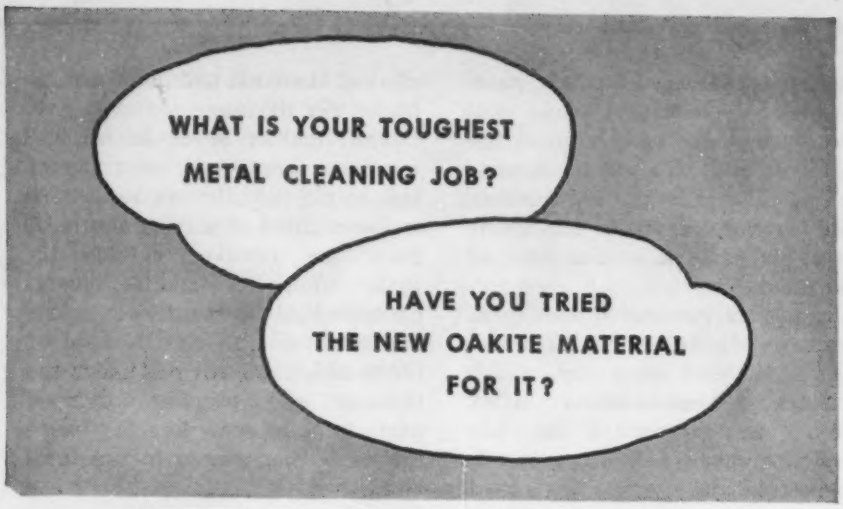
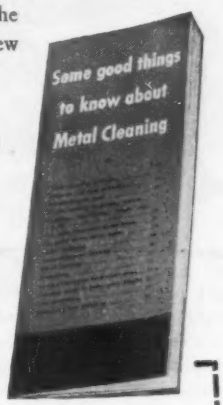


During the past year, the Oakite Chemical Research Laboratory has produced 16 new materials for performing the following metal cleaning and processing operations:

1 Heavy-duty cleaning in tanks
2 Etch-cleaning aluminum
3 Washing in pressure-spray machines
4 Electrocleaning zinc-base die castings
5 Putting heavy zinc phosphate coatings on steel in preparation for painting
6 One-operation cleaning, pickling and conditioning for painting
7 Stripping paint
8 "Killing" paint in spray booth wash water
9 Drawing and forming

One of these new materials may be the right answer for some problem that's been giving you a lot of trouble. Just circle the job number in the coupon, and let us tell you about the new chemical designed for the work.



FREE Our 44-page illustrated booklet "*Some good things to know about Metal Cleaning*" has been revised to discuss the application of the 16 new materials.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS • METHODS • SERVICE

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OAKITE PRODUCTS, INC.
30H Rector St., New York 6, N. Y.

Send me a FREE copy of "*Some good things to know about Metal Cleaning.*" Also, give me more information about new Oakite materials for the jobs listed in your advertisement, as indicated by the numbers circled below:

1 2 3 4 5
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NAME _____

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plating operation is entirely push-button. Conventional crane control buttons are used to move the tumbler over the 40-ft Alodine tank and lower it into the solution. The operator controls the crane from his position at the head of the tank.

To put the tumbler in motion, he reaches behind him to an on-off switch, mounted on a post, which actuates the tumbler motor. After the required immersion time has elapsed, tumbler action is stopped. Then crane and tumbler are moved clear of the tank, and parts are unloaded for drying.

The tumbler never is revolved when not submerged, even though this might simplify drying. Serious scratching of plating results if parts are revolved outside the tank. Under construction now is an unloading cart with dimensions and partitions to match those of the tumbler. It will roll under the tumbler and partition dumped parts into the same lots they were assigned when placed in the tumbler.

clocked at 5800%

PIVOT HIGH SPEED STEEL PUNCHES
STRAIGHTGROUND • WHIPSLEEVED

INCREASE PRODUCTION AT ERA TOOL AND MFG. CO. *MORE THAN 65 TIMES!*

Mr. Ervin Lonze (left), President, and Mr. Kenneth Rolin (right), Chief Tool Engineer of Era Tool and Mfg. Co., of Franklin Park, Illinois, experts in precision parts production, say:

"We built another die, using Pivot Straightground Punches, to produce tuner chassis. Short runs over a period of 18 months have totaled 125,000 parts and the die has not been in the die repair department once.

"It is easy to understand why we have standardized on Pivot Straightground Punches and why we now are building better dies for less."

Three of the eleven holes to be perforated in .042, ¾-hard, clock brass were to be .019, .023 and .027 — holding .0004 tolerance with 125 micro finish or better. That's a tough job — and production with the original die and ordinary punches, using the quill or point guide principle, was 15 to 600 pieces per set-up.

Then the die was equipped with Pivot Straightground Whipsleeved Punches. Production immediately averaged 40,000 — **with no rejects** — without breaking a single punch!

You, too, can gain the advantages of greater concentricity, accuracy, power and longer punch life, at minimum maintenance cost. Put Pivot Punches to work for you NOW.

SEND FOR FREE CATALOG AND STANDARD PRICES. **WRITE DEPT. I.A.**

tondra-treated FOR EXTREME HARDNESS

pivot punch and die corp.
NORTH TONAWANDA, N. Y.

Belt Grinding:

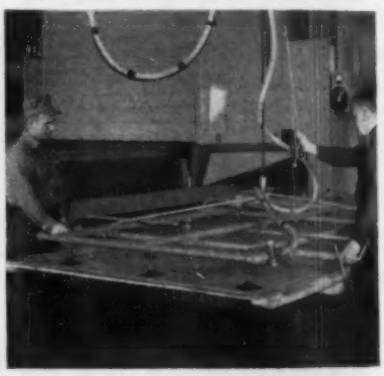
Special machine developed to taper wing sections.

Abrasive belt grinding has provided an inexpensive and rapid method of tapering aluminum wing sections. To meet the demands for continuous, heavy-duty operation on this work, more powerful grinding machines have been especially designed for this job by The Hill Acme Co., Cleveland.

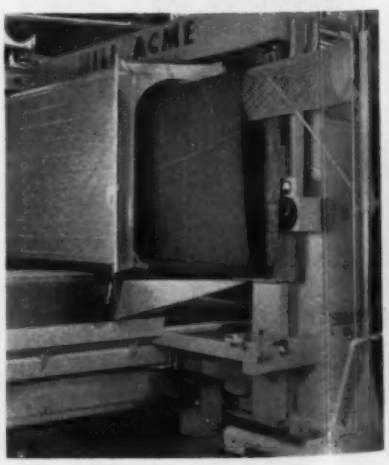
Working to both close tolerances and fine finish specifications, the machine uses factory coated abrasive cloth belts 138 in. long and with a maximum width of 84 in.

Has Reciprocating Table

The abrasive belt grinder is powered with a 250 hp dc motor, and the hydraulic reciprocating table drive permits instantly variable speeds.



Handling heavy plate . . .



Belt is 84 in. wide . . .

Equipped with a coarse grit silicon carbide abrasive belt the machine efficiently removes heavy stock as well as grinding to close tolerances. Grinding is done over the entire width and length on the aluminum plate through each pass of the table under the abrasive belt.

Coolant Filtered, Reused

Grinding and finishing operations are performed with waterproof cloth abrasive belts and a coolant. This "wet" process is necessary to prevent metallurgical changes that occur in aluminum if the temperature increases beyond the critical point and to avoid "loading" of belts. All coolant is filtered and recirculated. Sludge may be salvaged and remelted.

Pneumatic Belt Centering

The 2-roll vertical head assembly consists of a balanced upper steel idler roll and a lower rubber covered work roll, over which the belt travels.

The work roll is the driving roll and eliminates slippage of the abrasive belt, increasing belt life. Further, a pneumatic belt centering device insures positive tracking of the abrasive belt irrespective of dirt or moisture. The centering mechanism is adjustable to compensate for varying width belts within the capacity of the machine.

Special Work Roll

Quill type spindle housing assembly supports the back end of the rubber covered contact roll. The front end is supported by a roller bearing assembly which facilitates changing the work roll. A hard neoprene cover on the work roll provides the cutting action necessary for the heavy roughing as well as fine finishing cuts on aluminum plates.

Covered Contact Roll

The covered contact roll and steel idler roll are dynamically balanced and mounted in antifriction bearings. Rolls are provided with a pneumatic brake mechanism. One brake is located on the jackshaft of the main drive motor, the second is built into the upper steel idler roll. When a change in belt operations is required, or in the event of belt breakage, pressing a pushbutton to actuate brakes to stop the contact roll, idler roll and abrasive belt.

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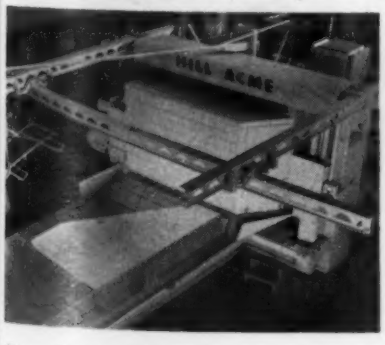
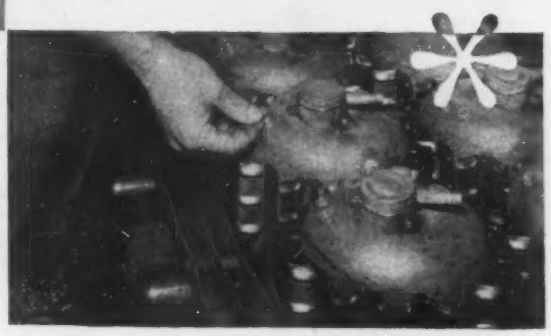


Ready to grind . . .

Alloy Rings

cut Brazing Rejects to less than 1% in Refrigerator Compressor Dome Assembly



* Actual photo of refrigerator plant production line where 11 joints are brazed on one assembly with less than 1% rejected under Underwriter's pressure test of 1500 lbs. per sq. in.

Alloy brazing materials insure a perfect job every time . . . consistently uniform, trouble-free brazing with no rejects . . . no reworking!

No question about it—Production Brazing with Alloy Rings is the practical answer to many expensive metal joining problems. Investigate . . . production brazing can help you conquer those sky-high production costs.

Precision is of the utmost importance in successful brazing. For infallible results insist on precision-made Alloy Rings. Special Alloy packaging methods speed production and cut waste to a minimum.

Write for full information on brazing rings, preformed shapes, silver alloy, copper, soft solder and flux.

Alloy RINGS

ALLOY RING SERVICE, INC. • 1099 EAST 52ND STREET • INDIANAPOLIS 5, INDIANA

Welding:

Cutting devices simplify joining of pipeline sections.

Improved machining devices have simplified both field welding and testing of steel pipelines. Typical is the 860-mile Gulf Interstate Gas Co. Line running from the coast of Louisiana into West Virginia.

In making this installation, the company used a new welding system at all highway railroad and river crossings where ⅜ in. wall X-52 pipe is joined to ½ in. wall X-52 pipe.

No Transition Piece

This weld preparation eliminates use of a "transition piece" allowing one weld to take the place of two, and permitting greater distance between welds in keeping with best welding practices.

Field machining of the ½ in. wall pipe with a new inside beveling attachment for the Wachs National Pipe Saw makes this single type weld possible.

The ½ in. wall pipe was double or triple joint welded into lengths required for crossings. Test plugs were then welded on the ends and an 8 hour hydrostatic test was run on every crossing section. This necessitated cutting the test plugs off of the heavy wall pipe at completion of the hydrostatic tests.

In One Operation

A standard saw and external bevel cutter were used. This cut and bevel were made in one operation. At the completion of the cut the beveling attachment was used to bevel machine the 12 in. pipe to proper welding thickness for ⅜ in. wall pipe. After beveling (inside and outside) the pipe is ready for welding.

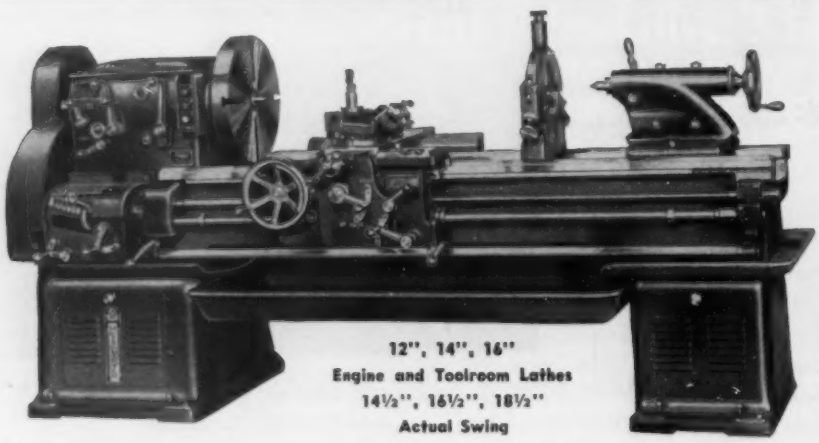
Trims both edges . . .

Machining the bevel . . .

For Dependable Accuracy!

BRADFORD

METALMASTER LATHES



12", 14", 16"
Engine and Toolroom Lathes
14½", 16½", 18½"
Actual Swing

BRADFORD Metalmaster Geared Head Lathes have earned an enviable reputation throughout the years for high efficiency and dependable accuracy. But today's new Metalmaster is even finer! Built to the most exacting standards of workmanship, and of the finest materials and components, these new Metalmaster Lathes are equipped with many outstanding features.

POWER for Your Job: 2 HP to 10 HP

SPEEDS for Your Job: 16 RPM min. to 1000 RPM max.

FEED: 72—.00072 to .1780

THREAD RANGE: 1½ to 368, including 11½ and 27 without extra gearing

• *Let our Engineers solve your lathe problems.*

• *Write for Bulletin 179*

THE BRADFORD MACHINE TOOL COMPANY

670 Evans St., Cincinnati, Ohio • *Precision Since 1840*

DELIVERIES: 30 days, subject to prior sale

Instruments:

Tiny gage measures breeze to blast pressure changes.

A miniature gage which will enable scientists to make more efficient studies of pressures resulting from nuclear explosions has been developed at Armour Research Foundation of Illinois Institute of Technology, Chicago.

Breeze to Blast

The pressure gage, one of the smallest of its kind ever made, can measure pressures as low as those from a breeze to those that would demolish the sturdiest of buildings.

Its chief use at present is in small models used in laboratory studies of simulated atom bomb blasts. The "business end" of the gage measures ⅛-in. in diam. Several dozen gages can be mounted in the models. Information on how to make the gages is shared with other organizations throughout the country studying blast effects.

Data on blast effects can be obtained with the use of a shock tube. The shock tube is an 18-ft long tube with an 8-in. square cross-section. Tubes of other dimensions also are in use.

Produces Pressure Wave

Air pressure is built up in a chamber at one end of the tube, then released suddenly when a plastic partition is pierced. This produces a pressure wave, or shock wave, which travels down the tube.

The shock wave, traveling the length of the tube, simulates an atom blast. At the far end of the tube, a model is mounted. The model is a small metal block, but the blast pressure measurements on it can be used to predict effects on most types of structures.

The gage can be used to measure blast pressure on small areas. One of the gage's most important characteristics is its rapid response to changing pressures. With most other types of pressure gages, there is a lag between the time the gage senses the pressure and records it. Lapse is measured in millionths of a second.

Idea behind the gage is comparatively simple. The gage converts blast pressures into electrical voltages. The electrical output varies with the amount of pressure the gage senses. The voltage, in turn, actuates a recording device which gives a permanent record on film of the pressure change.

Sensing part of the gage consists mainly of a tiny tube of the ceramic barium titanate. Pressure on the surface of the gage is relayed to the barium titanate tube.

The pressure actually squeezes the tube a few millionths of an inch out of shape. This squeezing action generates the voltage. This is referred to as the piezo-electric effect and is similar in operation to the new-type ceramic phonograph pickup used on record players.

A DAKE PRESS replaces the "*hernia method*" of driving plugs out of cable sockets

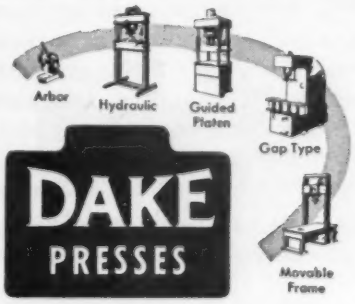
A concern that supplies cable slings for steel mills re-uses the closed-type sockets after driving out the cable-and-solder plugs.

Knocking them out was formerly a "brutal" job for two men. One held a driving pin, while the other swung powerful blows with a sledge. Working full time, they couldn't keep up with production requirements, and it was difficult to keep men for such hard manual labor.

Today, one man handles the entire job easily with a Dake Press, in 16 to 20 hours a week. Labor cost is less than 25%, and workers are mighty glad that the rugged hand sledging days are over.

Are you using Dake Presses for the hard jobs in your shop? Dake Catalog 129 shows many standard arbor and hydraulic presses . . . or, if you have a special problem, Dake can custom engineer a press to your particular needs. Why not ask?

Dake Engine Company, 602 Seventh St., Grand Haven, Mich.



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DAKE ENGINE COMPANY
602 Seventh St., Grand Haven, Mich.

Please send me a copy of Dake Catalog No. 129

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Company_____

Address_____

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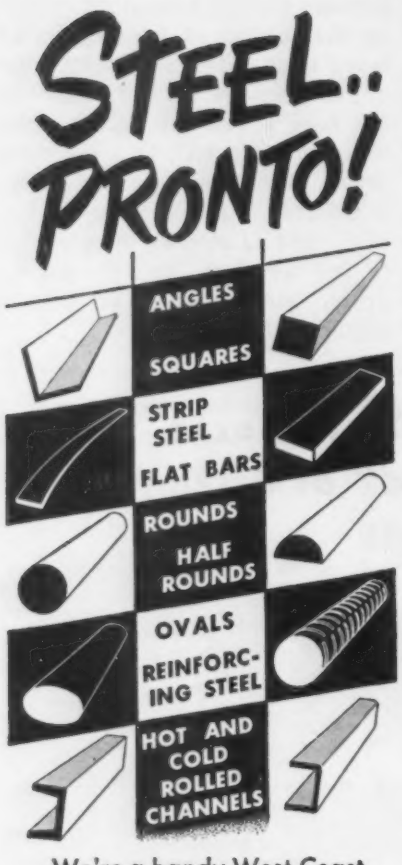

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AT LOW COST
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STEEL ROLLING MILLS, INC.
1750 FOURTH AVENUE SOUTH
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Materials Roundup

Steel Powder:

New alloy gives high strength without secondary treatment.

Development of a prealloyed steel powder permits fabricators to make high strength parts by briquetting and sintering without resorting to secondary treatments other than simple hardening. The new powder, designated 4650-A, is produced by Vanadium-Alloys Steel Co., Latrobe, Pa.

Toughness and hardenability of 4650-A powder parts permit the making of gears and other high-strength, high-production parts at substantial savings.

The new alloy steel powder has excellent green strength and is readily moldable at low pressures to yield dense, strong compacts. Basically a nickel, molybdenum composition, this AISI grade is also made with other carbon contents.

Other improvements in the characteristics of the powder are its ease of heat treatment, toughness comparable to alloy steel, and its strength which eliminates costly procedures necessary to strengthen other metal powder parts.

Nodular Iron:

Ductile material gives crankshafts high strength.

Nodular iron, a comparatively new ductile material, has found a new application in crankshafts in gas engine-driven compressors. The Cooper-Bessemer Corp., Mt. Vernon, Ohio, revealed this application after 4 years research.

The ductile iron used in these crankshafts provides an unusual combination of high strength, high wearing qualities and good machineability, particularly ideal for engine crankshafts. The high notched endurance limit characteristic of nodular iron makes the metal especially suitable for heavy-duty crankshaft service.

FOR MORE DATA ON MATERIALS

More information on any item reported in this section may be obtained by using the reply card on page 137. Indicate the page on which the item appears and note exactly the information wanted.

Plastics:

Epoxy resins and hardeners have many new uses.

A new group of epoxy resins and hardeners developed by Bakelite Company, a division of Union Carbide and Carbon Corp., have been synthesized to form strong, lightweight products with excellent chemical resistance and electrical properties.

Good Wetting Ability

Epoxy resins have gained prominence because of their wide application in divergent industrial fields such as, potting electronic assemblies, automotive tools and forming dies.

A controlled process produces uniform high quality resins that cure to hard solids at low or room temperatures without applied pressure and with little shrinkage. The excellent wetting ability of these new epoxies makes possible their combination with many types of inert fillers."

Dies Cast from Resins

Dies for drawing metal may be cast from these resins when specially compounded and formulated for this purpose. Accurate checking fixtures, frames, patterns, tooling jigs, and dies for automotive and aircraft production make use of the new resins' mechanical strength, light weight, and dimentional stability. Gears and bobbins are easily machined from cast rods, sheets, or tubes.

Use of low cost plastic tooling has recently made considerable progress in both the aircraft and automotive industries.

Aluminum:

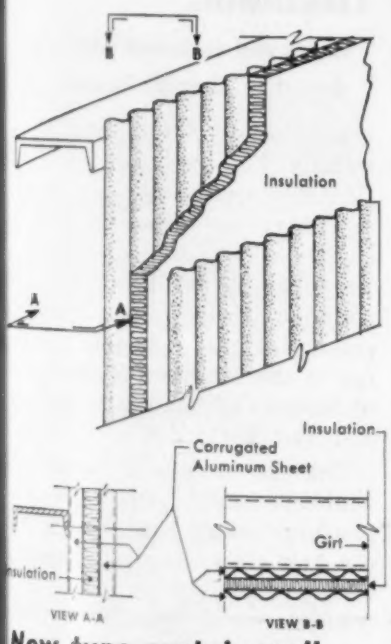
Good insulating material simplifies erection problems.

A new easy-to-erect aluminum sandwich curtain material has twice the insulation value of a 12-in. masonry wall. By its use, the U. S. Air Force saved time, money and future maintenance costs on its huge heavy press plant at the Cleveland Works of the Aluminum Co. of America. The plant contains 157,711 sq ft of this material for siding.

The curtain-wall is made from two slices of corrugated aluminum sheet between which is a 1-in. thick layer of glass fiber insulation.

Applied to Siding

The sandwich wall is easy to construct on the job and therefore was not supplied in prefabricated form. First, one layer of 0.024-in. thick siding was applied directly with self-tapping screws to the siding girts of the structural steel framework. The fiber glass insulation and siding were then fastened in place.



New type curtain-wall . . .
Turn Page

ARMSTRONG
Carbide
TOOL HOLDERS

For Higher Speeds, and Heavier Feeds

ARMSTRONG Carbide Tool Holders and ARMIDE (Carbide Tipped) Cutters come in cased sets for tool rooms and maintenance departments, and individually in all sizes for general machine shop and production turning. They permit not only the ready machining of sand-filled castings, the hardest and toughest steels as well as many heretofore "unmachinable" materials, but also make practical much heavier cuts and cutting speeds up to 600 f.p.m. on ordinary work. They also run from 10 to 100 times as long between regrindings.

Write for Catalog

ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"
5209 WEST ARMSTRONG AVE., CHICAGO 30, ILLINOIS
NEW YORK • SAN FRANCISCO

HOW KRANE KAR SWING-BOOM CRANE SAVES M-H* DOLLARS

A MACHINERY MFR. reports, "KRANE KAR has cut our Materials-Handling costs on the average about 75%."

A FORGING PRODUCER writes, "Up to a quarter-million pounds of steel moved in an 8-hour day."

"KRANE KAR," a BALL BEARING MFR. says, "unloaded 50 tons of tubing from a box-car and transferred same to truck in 3 hours."

Another MANUFACTURER: "Simplified our materials-handling . . . *saved us $3824.24 in 8 months.*"

ADDITIONAL CASE HISTORIES IN ILLUSTRATED BUL. #89

*MATERIALS-HANDLING

Gas or diesel; 9 to 37 ft. booms or adjustable telescopic booms; solid or pneumatic rubber tires.

TRANSPORTS, STACKS, STORES

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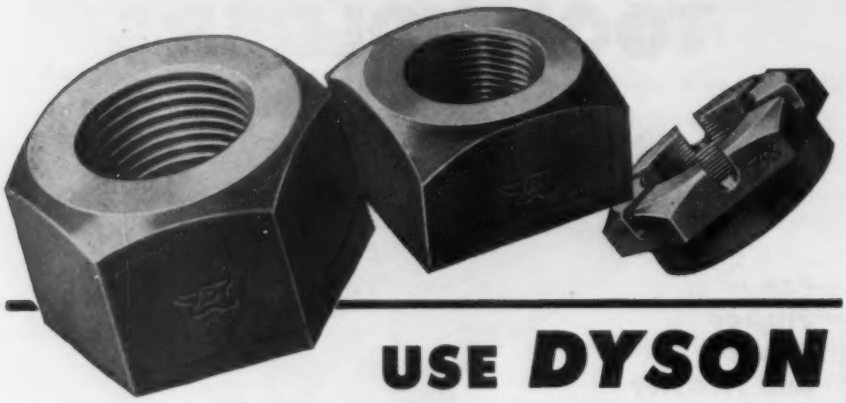

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Carbon or Alloy Steel . . . Regular Standards Carried in Stock . . . Prompt Service On Special Requirements . . . Starting Size . . . 2¾" Thru 12" Bore Size . . . For Marine Service, Railroads, Large Presses, Engines, and Large Machine Equipment . . .

Hex - Square - Round

Heavy, Regular, Full, Half, Jam, Sleeve, Mechanic's, Castle, Jack, and Slotted Nuts . . . Also Large Nuts to Your Engineered Specifications . . . Adequate Steel Stocks, Machining and Heat Treating Facilities Assure Prompt Service . . .

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To win your Production battle . . . with

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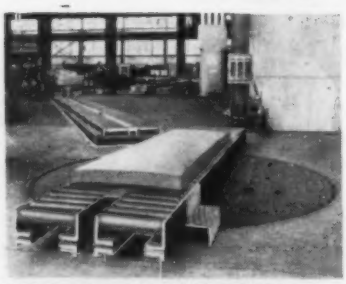
The name to remember is . . .

ALVEY-FERGUSON

the original Since 1901

This A-F Roller Conveyor mounted on a powered turntable distributes stacked sheet steel to the many work bays in this modern steel plant—easier and faster.



THE ALVEY-FERGUSON COMPANY

563 Disney St., Cincinnati 9, Ohio

Offices or representatives in principal cities

Write for complete information

Silicon Carbide:

Use as purifier proves aid in steelmaking practice.

Silicon carbide, the man-made abrasive produced from sand and coke in an electric furnace, is used in a new line of deoxidizers which helps to purify molten metal in either a hearth or electric furnace.

The silicon carbide, which is made in different grain sizes, is broken down by the hot metal into specially reactive forms of silicon and carbon. This new line, known as Electrocarb SP, is produced by Electro Refractories & Abrasives Corp., Buffalo.

Combines With Metallic Oxides

The silicon and carbon combine with minor amounts of metallic oxides and other impurities in the steel to remove them as part of the slag or as gases which escape. The result is a purer cleaner steel.

The deoxidizer is packed in 25-lb paper bags. The entire bag may be dropped in the melt since its special paper will not add harmful elements.

Titanium:

Improved material will be produced in special furnace.

Increasingly large titanium remelting furnaces, and substitution of a special vacuum melting procedure for conventional inert gas atmospheres in such furnaces, have had a dramatic effect on metal quality and point the way to significant cost reduction according to the Titanium Metals Corp. of America of Henderson, Nevada, and New York, N. Y.

The giant 20-ton automatic double-melting furnace of proprietary design here shown for the first time completely remelts 4,000-pound titanium ingots with improved metal homogeneity. The new melting process permits removal of hydrogen from titanium to as low as 50 parts in a million.

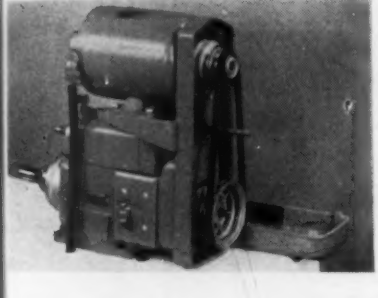
NEW EQUIPMENT

New and improved production ideas, equipment services and methods described here offer production economies . . . for more data use the free postcard on page 137 or 138.

Hydraulic tracer converts general purpose lathe

Production turning is one advantage obtained by the addition of Trace-O-Matic hydraulic tracer attachment to Axelson heavy duty lathes. Cost reduction over former methods and the ability of the lathe to handle a variety of work economically are others. Initial installation requires no special skill and reverting to a standard lathe takes only 15 min. The rugged unit does not restrict the swing, or capacity of the lathe to take heavy roughing cuts or fine precision finishing cuts. Parts are duplicated from flat, inexpensive templates. All classes of work with uninterrupted cuts are handled automatically with the Trace-O-Matic. Close contoured tolerances can be maintained. *Axelson Mfg. Co. Div.*

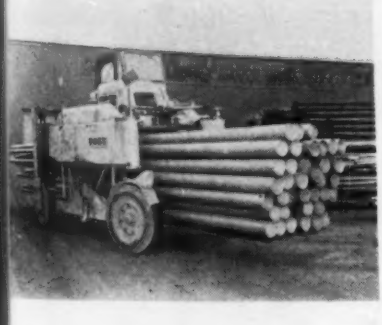
For more data circle No. 39 on postcard, p. 137.



Belt drive adds spindle speed flexibility

New V-belt drive arrangement broadens the spindle speed range and versatility of Rockwell's standard air-hydraulic drill units. The accessory includes cast iron pulley guards and a motor plate that accommodates NEMA rigid-mounted motors. Drive arrangement brings the unit into compliance with JIC machine building specifications. Using standard four-step dynamically balanced pulleys, the accessory makes it possible to obtain 24 different spindle speeds. *Rockwell Mfg. Co.*

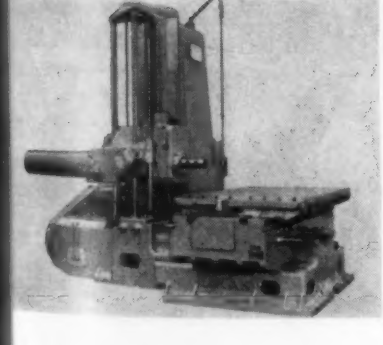
For more data circle No. 40 on postcard, p. 137.



Ross straddle carrier has 20,000 lb capacity

Designed for general plant materials handling applications, a new medium capacity Ross straddle carrier features increased speed of operation, improved accessibility for maintenance and excellent drive visibility. Cab itself has been made larger for greater operator comfort. Removable compartmentalized covers provide quick access to engine and hydraulic system. All-hydraulic operating controls and a concealed spring arrangement in the corner posts contribute to near service-free operations. Load hoisting speed is 35 fpm. *Clark Equipment Co.*

For more data circle No. 41 on postcard, p. 137.



Boring machine features space-saving design

New precision horizontal boring machine is a compact, rugged, short bed length machine without backrest. This type machine incorporates the advantages of the horizontal boring machine, but is small enough to fit into tool room areas to handle jig and fixture work. The short bed machine provides production line operations that do not require line boring operations with backrest support. Standard line advantages include electric pendant control of spindle rotation and feed-rapid traverse operations; four-way bed to support table and saddle for long cross travel work. *Lucas Machine Div.*

For more data circle No. 42 on postcard, p. 137.

Turn Page

Ideal For Small Metal-Working Manufacturer

FOR SALE

BUILDINGS AND EQUIPMENT

Ready to Move In!

These facilities are located in a town of 9,202 population in an established and fast-growing industrial area. Situated on the Norfolk and Western Railway, with a siding already constructed. The brick main building, providing 7,000 sq. feet of floor space, is less than 10 years old, and radiantly heated. Adjacent buildings, in good repair, are easily adaptable to various uses, including office space. For full particulars contact the Industrial and Agricultural Dept., Drawer IA-653 Phone 4-1451, Norfolk and Western Railway, Roanoke, Va.

EQUIPMENT

Equipment which may be purchased with these facilities, already installed, includes lathes, drilling machine, shaper, floor grinder, electric hoist on overhead runway, air compressor, and other items in first-class condition. Also, office equipment. *We will provide you with a complete and detailed list of all equipment.*

ADVANTAGES

- Nearness to markets
- Nearness to Bituminous Coal
- Excellent Climate
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- Dependable N & W Transportation
- Good, Clean Community
- Friendly, Cooperative People
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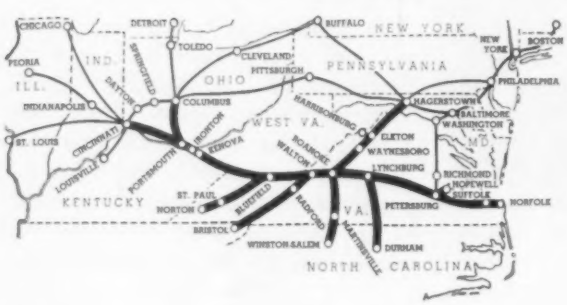
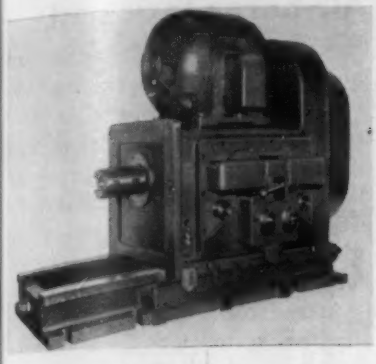
Roomy, well-lighted machine shop

Stock room with excellent shelving

Clean, modern wash and locker rooms



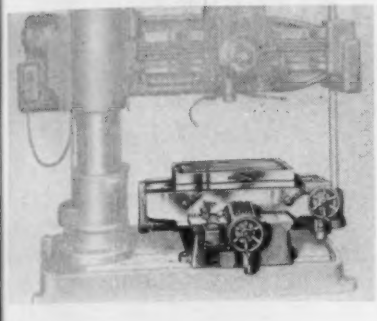
Norfolk and Western RAILWAY



Hydraulic unit affords production flexibility

Fast, low cost production on a variety of workpieces or operations requiring drilling, reaming, boring, facing or milling is possible with new Hoefer hydraulic feed units. Completely self-contained, they provide single purpose machining efficiency and maintain wide production flexibility. Units may be mounted on any machine bed or column at any angle, and removable heads interchanged as desired or units themselves may be interchanged to effect a wide range of production equipment. The power panel slides entirely out of the unit and permits fast simple inspection and adjustment. *Hoefer Mfg. Co.*

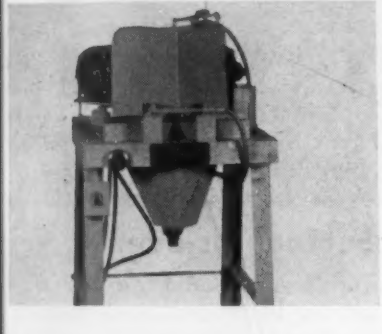
For more data circle No. 43 on postcard, p. 137.



Positioning table for use with radial drills

The Fosdick automatic positioner gives exact reproduction of precision drilled, bored, tapped and reamed parts—without jigs, without setting stop adjustments. Once two simple duplicating bars are prepared, positioning of work is done automatically at the touch of a button, accurate to ±0.0001 in. The positioner is easily installed for use with existing rigid, radial equipment. Rigidity, true-running spindle are essential to get fine precision. Because the positioner moves the work, the radial is used in clamped position. *Fosdick Machine Tool Co.*

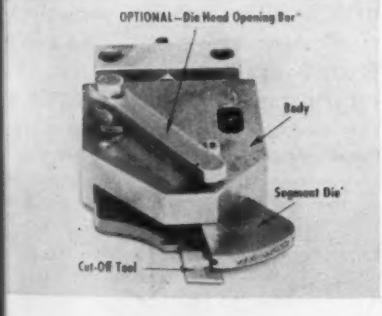
For more data circle No. 44 on postcard, p. 137.



Two 45° miters cut in one operation

Two-head mitering machine for cutting two complete 45° miters in one operation has been engineered for cutting extrusions in aluminum, brass and copper, work usually done by window and door fabricators. Built for high-volume production, the cutting cycle is completely automatic and is activated by hand or foot-operated controls. The machine is furnished complete with all motors, four Si-Maloy 10-in. saw blades, oil mist spray for longer blade life, controls, etc., for immediate cutting when attached to electrical source. *Stone Machinery Co., Inc.*

For more data circle No. 45 on postcard, p. 137.



Automatic marker performs two operations

A dual-operation screw machine tool performs marking and cutting off on automatics. This Model 700 automatic marker can be used in conjunction with almost any suitable screw machine tool for cutting off, etc. Production is increased by reducing the length of the machining cycle. By combining marking with cutting off operation, the 2 to 3 sec dwell normally required for swing marking is eliminated. The die used for marking is a segment and is carried clear of the part after marking while the cut-off tool continues its operation to completion. *New Method Steel Stamps.*

For more data circle No. 46 on postcard, p. 137.

Swing frame grinder uses wheel, buff or belt

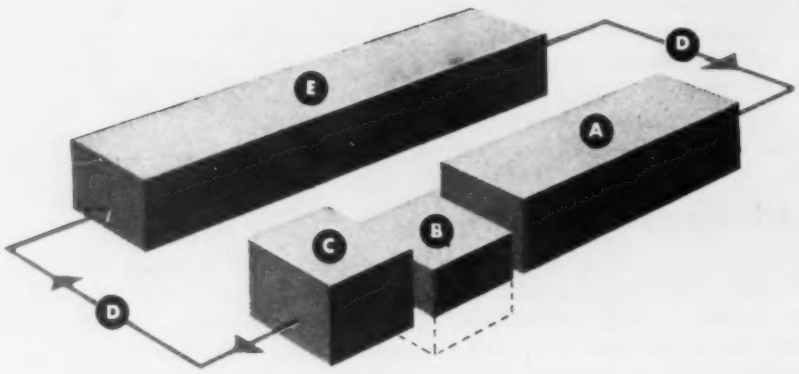
Versatile swing grinder for use with a grinding wheel, buff or abrasive belt can be used in small, as well as large plants for a variety of operations. It can be suspended and brought to heavy or bulky work; can be rigidly mounted and used as a variety grinding and polishing unit, such as mounting on a lathe for OD grinding and polishing. Features include compact design, rugged construction, adjustable balance, high speed, maneuverability, positive and convenient tracking mechanism, and belt tensioning. The 3 hp motor produces 3400 rpm providing 7700 sfpm. *Curtis Machine Corp.*

For more data circle No. 47 on postcard, p. 137.

Turn Page

Heat Treat Furnace Layout

by Holcroft ... 7th of a Series



A SOLUTION FURNACE (8 HRS. @ 940°F.)
B HOT WATER QUENCH
C BLAST QUENCH
D AUTOMATIC TRANSFER
E PRECIPITATION FURNACE (13 HRS. @ 460°F.)
F TRAY TRANSFER

Controlled Heat Treating of Forged Aluminum Parts

A battery of five installations like the one above—each over 100 feet long—treats 11300 pounds of aluminum forgings every hour in a government project in the midwest.

Parts go through a solution furnace and then are either quenched in hot water or blast cooled with air. Forgings are automatically transferred to a precipitation furnace where they are age hardened. Temperatures are held within plus or minus 5°F.

Tough job? Not particularly! All Holcroft installations, from the smallest to the largest, can be designed around automation—the elimination of the human element. On top of that, when necessary, furnaces can tie right into the production line.

It doesn't take long for installations like these to pay off in a BIG way! Holcroft & Company, 6545 Epworth Blvd., Detroit 10, Michigan.

BUILT BY HOLCROFT & COMPANY DETROIT-MICH

PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

CHICAGO, ILL. • CLEVELAND, OHIO • HOUSTON, TEXAS • PHILADELPHIA, PA.

CANADA
Walker Metal Products, Ltd.
Windsor, Ontario

EUROPE
S. O. F. I. M.
Paris 8, France

—New Equipment—

Continued

Air-borne toxic dust

New filter protects industrial and laboratory workers against air-borne particles including the hard-to-handle 0.3 micron size, with 99.99 pct efficiency. The Super Micro-Toxisol respirator removes air-borne radioactive matter and other toxic dust, mist and fumes. Filtering area is 45 sq in. Element is in the form of multifolded corrugated cylinder. Each filter is tested on special testing device at the factory. *American Optical Co.*

For more data circle No. 48 on postcard, p. 137.

Pipe cutters

New automatic knife pipe cutters for hand or power use are now being marketed. Different types of knives are available for cutting, beveling for weldments or grooving for compression type joints, and for cutting Saran lined pipe. The knives can be quickly changed for the various operations; have the Beaver safety-depth guide ahead of the cutting edge to prevent hogging-in and knife breakage. Knives cut without leaving burrs. *Beaver Pipe Tools, Inc.*

For more data circle No. 49 on postcard, p. 137.

Surface grinder

The Boyar-Schultz 6 x 12 surface grinder is available with hydraulic longitudinal action. A new hydraulic valve affords perfect reciprocating movement. Change from hydraulic to hand feed and return can be accomplished in a few seconds. *Boyar-Schultz Corp.*

For more data circle No. 50 on postcard, p. 137.

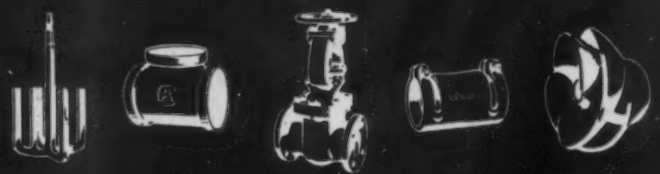
Turn Page

SPECIFY

OPER ALLOY PRODUCTS

...AND Relax

You'll sleep like a baby once you've put your corrosion problems in our hands. Whether you want that specially engineered part to be just right—or need top quality cast stainless components in large quantities—or are looking for reliable stainless steel valves, fittings and accessories, specify Cooper Alloy, and stop worrying. One thing is sure—our reputation was built on quality. Use our products with confidence and relax.



mixer fitting valve Quikupl impeller

COOPER ALLOY

THE COOPER ALLOY FOUNDRY CO. • HILLSIDE, N. J.

Los Angeles, San Francisco, Oakland, Houston, Chicago, Detroit, Philadelphia, Hartford

Leading producers of STAINLESS STEEL valves, fittings and castings

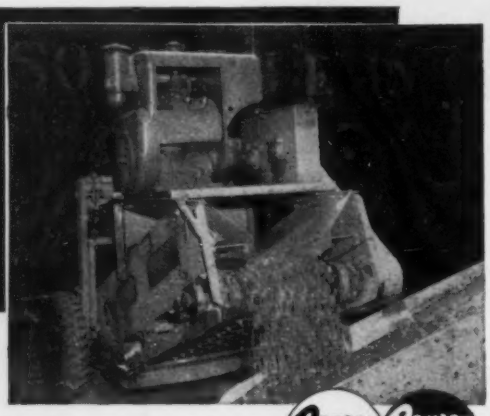
"I don't care if they are our most important asset. You can't fill this safe with your MOLITE High Speed form tools."

COLUMBIA TOOL STEEL COMPANY • CHICAGO HEIGHTS, ILL.

Producers of fine tool steels — All types immediately available through Sales Offices, Warehouses and Representatives in Principal Cities.

TOOL COLUMBIA STEELS

WISCONSIN-POWERED HAISS CAR UNLOADER



Speeds Up Material Handling

Power TO FIT THE JOB Power TO FIT THE MACHINE

This Haiss Model 501 combination chain- and belt-type Car Unloader, made by the George Haiss Mfg. Co. division of Pettibone Mulliken Corp., provides another typical example of a time- and cost-cutting Wisconsin Engine power application.

Wisconsin Heavy-Duty Air-Cooled Engines have the "engineered-in" Lugging Power that stays with the job. When sudden shock loads slow down the engine speed and the torque builds up, your Wisconsin Engine *hangs on* and pulls through without stalling. Heavy-duty engineered design and construction, plus trouble-free AIR-COOLING, are factors that keep the work moving on schedule at all seasons, in all climates.

You can't do better than to specify "Wisconsin Power" for your equipment. Available in 4-cycle single cylinder, 2- and 4-cylinder models, in a complete power range from 3 to 36 hp.

V-type 4-cylinder 15 to 36 hp.

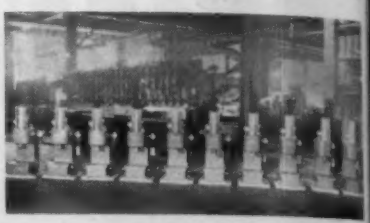
WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46, WISCONSIN

Bantam-size press

Pnu-draulic bench press—bantam size, air-oil combination hydraulic unit—weighs 300 lb and is capable of delivering 5 tons of pressure when connected to a 100 psi air line. Easily attached to any shop air line, the Model 500 has no motor and uses no electric power,



pumps or cooling water. Air filter protects the unit from damage caused by pipe scale and dirt in air line. Powerful ram thrust makes the Pnu-draulic suitable for staking, riveting, forming, piercing, crimping, sealing, broaching, trimming, marking and flanging. Particularly adaptable to line production as it occupies only 1 1/3 sq ft bench space. *Alliance Mfg. Co.*

For more data circle No. 51 on postcard, p. 137.

Small air drill

Portable air drill said to be the smallest and lightest tool for 3/16-in. heavy duty and ¼-in. light duty drilling weighs less than 1½ lb. It develops about ¼ hp and is said to consume 38 pct less air than most

standard ¼-in. drills. Small size enables operator to use the drill with minimum effort in assembly lines or close-quarter work. Balance, speed, efficiency and stall-proof power in continuous service are claimed for the drill. *Aro Equipment Corp.*

For more data circle No. 52 on postcard, p. 137.

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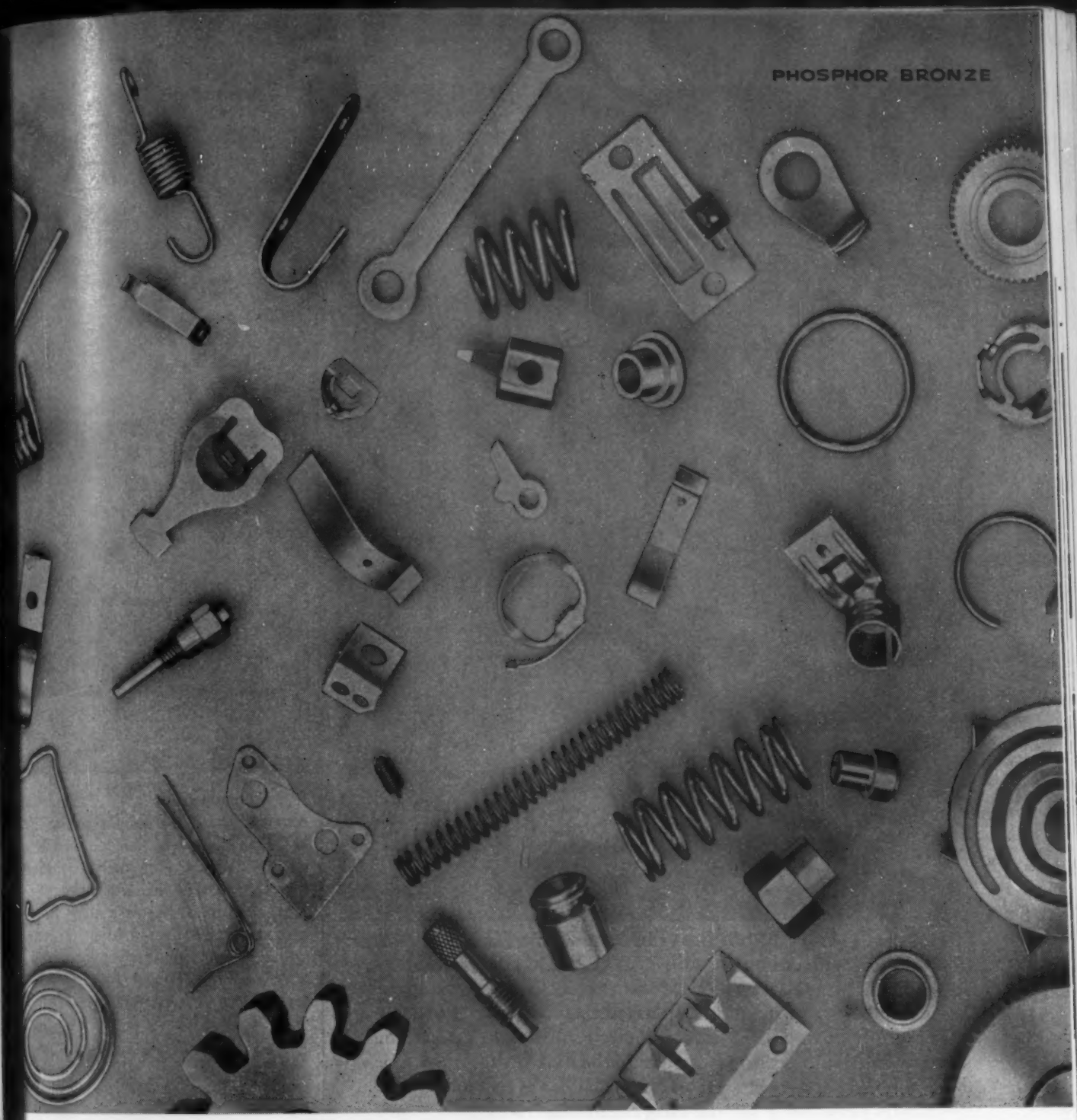


Parts made of tough ANACONDA Phosphor Bronze wear better, last longer

Seven alloys are available in sheets, plates, strips, wire, rods, bars and seamless tubes.

Constant wear and flexings. Periodic stresses. Fatigue and corrosion. These are the things that can knock machine parts out of commission. But they can't hurt those shown above.

Here's why. All of them are made of ANACONDA Phosphor Bronze Alloys. And these copper-tin alloys are strong and tough. They are non-magnetic. They conduct heat and electricity well. And you can work them easily.

In bushings, gears and bearings Phosphor Bronze doggedly resists abrasion. In switches, springs, diaphragms and electrical contacts it keeps its high elasticity under conditions where less rugged alloys fail.

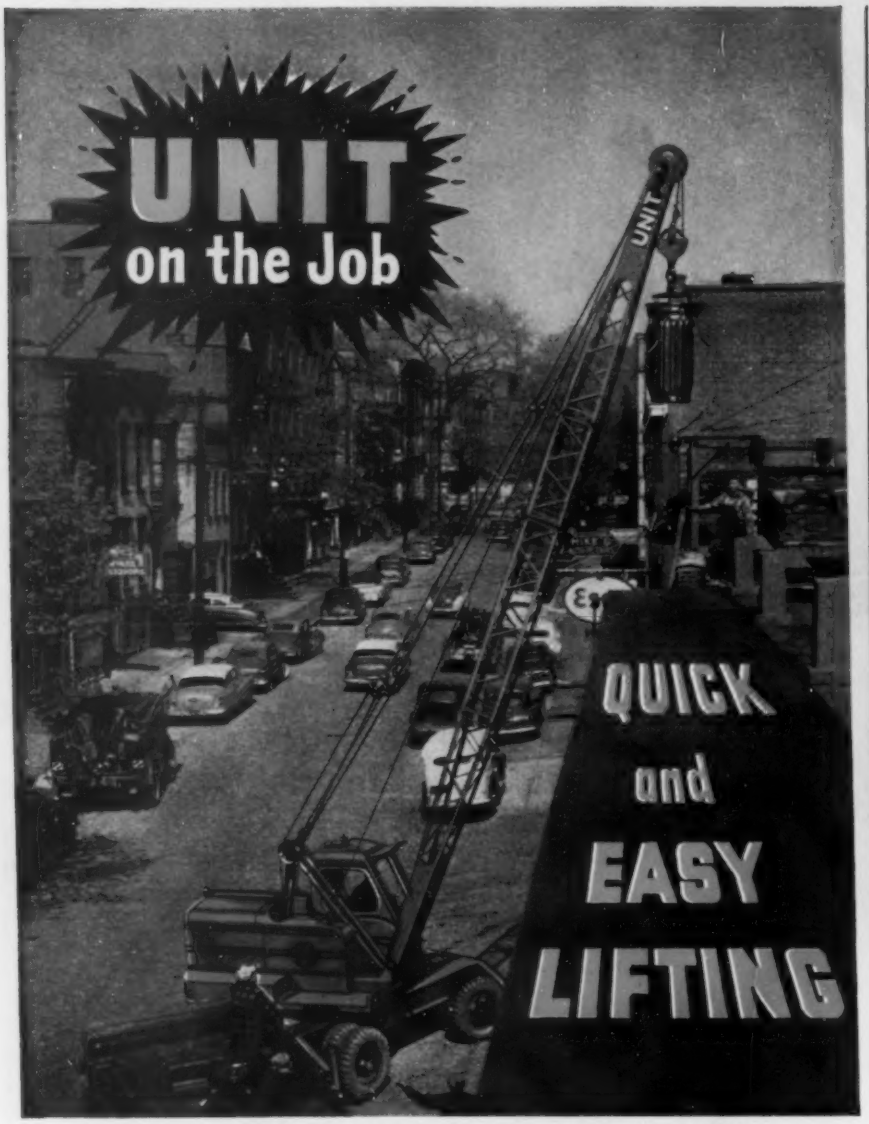
ANACONDA Prosphor Bronze comes in 10 standard compositions (including a free-cutting alloy). Tin content ranges from 1.25% to 10.0%.

Quality? Our record speaks for itself—a recent study of sheet metal covering two years' production shows that claimed unsuitable quality was at the amazingly low ratio of 400 pounds per million pounds shipped.

Tell us what you make and how it's used. We'll help you select the correct Phosphor Bronze Alloy. *The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.* 5484

ANACONDA®
PHOSPHOR BRONZE

Sheets • Plates • Strips • Wire • Rods
Bars • Seamless Tubes • Special Shapes



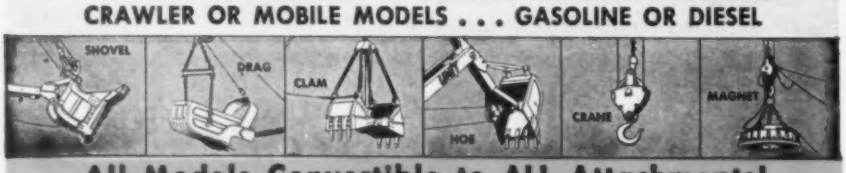
For SM-O-O-THER OPERATION you'll prefer UNIT 357 Mobile Crane equipped with TORQUE DRIVE. It's a machine that travels anywhere . . . works efficiently where space is limited. Controlled and operated by ONE man. Powered by ONE engine. Provides full-circle, fast-cycle operation. Easy hydraulic steering from within the FULL-VISION CAB. Promotes safety. For HIGH PRODUCTION and LOW MAINTENANCE get the facts regarding UNIT 357.

Write for Bulletin No. L-302.

UNIT CRANE & SHOVEL CORPORATION

6517 WEST BURNHAM STREET • MILWAUKEE 14, WISCONSIN, U.S.A.

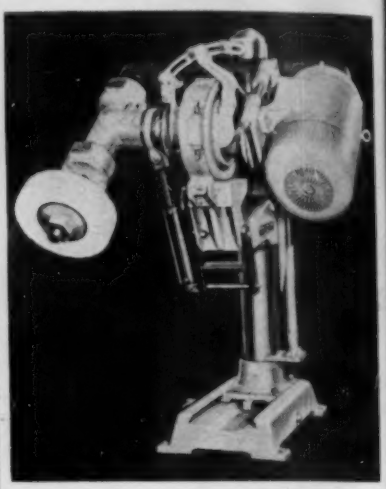
½ or ¾ YARD EXCAVATORS...CRANES UP TO 20 TONS CAPACITY
CRAWLER OR MOBILE MODELS . . . GASOLINE OR DIESEL



All Models Convertible to ALL Attachments!

Versatile polisher

New heavy-duty, multi-positioning buffing head can be positioned for any job by means of simple, conveniently located adjustment controls on the front of the head. It rotates in a full 360° swing on both axes, simultaneously; automatic positioning provides constant, full contact on the most

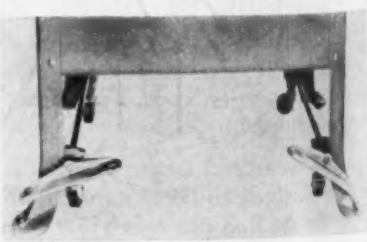


irregular shaped piece. Pneumatic controls for wheel lift-off are available for fully automatic installations. Adjustable fulcrum makes the No. 55 head an all-position, full contact polishing and buffing head, operating on any plane, on any angle even though compounded. *Murray-Way Corp.*

For more data circle No. 53 on postcard, p. 137.

Retractable casters

Durable, low-cost retractable caster sets cut plant costs and bottlenecks. They fit all types of Delta industrial metal and woodworking



power tools normally mounted on steel stands, making them portable. Casters can be lowered into rolling position by a foot lever. *Delta Power Tool Div.*

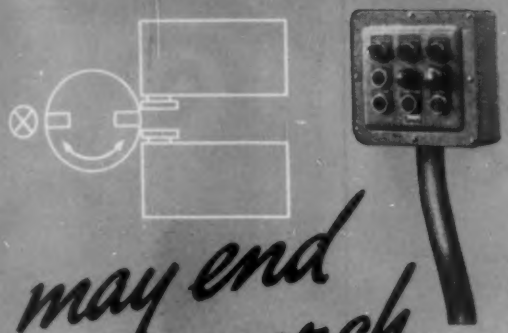
For more data circle No. 54 on postcard, p. 137.

Turn Page

Duplex Milling

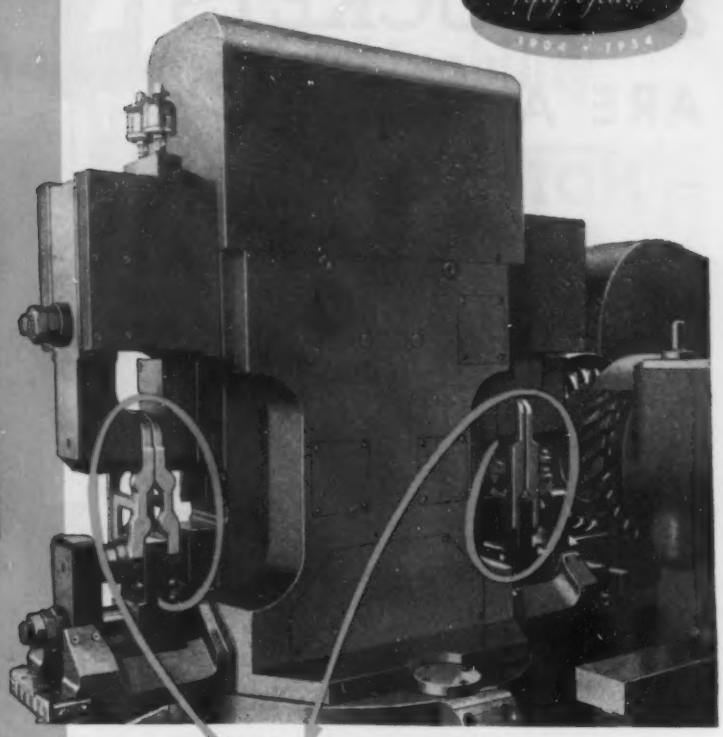
as Engineered by

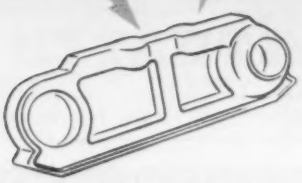
MOTCH & MERRYWEATHER



may end your search

Fifty Years 1904 - 1954

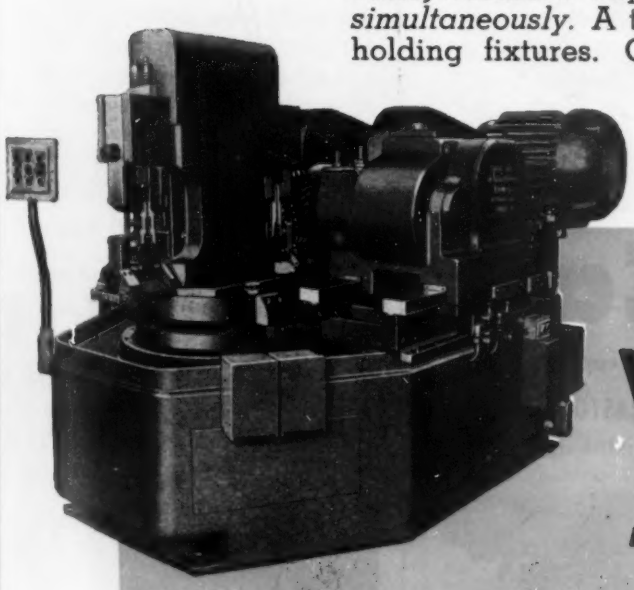




Both sides of tractor side bars are face milled. Production is 240 pieces per hour using high speed steel cutters.

PRODUCTION CAN BE RAISED 50% by Motch & Merryweather's *Duplex Milling Method!*

• Production milling is given new meaning by Motch & Merryweather's duplex method. Two heads mill two parts *simultaneously.* A table indexing 180° has two sets of work-holding fixtures. One operator unloads and loads during *duplex milling* at the opposite fixture. Fully automatic operation sets new production limits. Consult Motch & Merryweather about your production milling.



THE MOTCH & MERRYWEATHER MACHINERY CO.

MACHINERY MANUFACTURING DIVISION
CLEVELAND 13, OHIO

Builders of Circular Sawing Equipment, Production Milling, Turning and Special Machines

Erie BUCKETS ARE A *Specialty* — NOT A SIDELINE

Right from the start we thought enough about buckets to make them our specialty. That was 34 years ago. They're still our bread and butter.

Today, thousands of Erie units all over the world are turning in top performance. That's because they were built with a complete understanding of what they had to do.

Why not let our engineers review your set-up. There's no obligation. And, based on past experience, we're sure we can offer a helpful suggestion.

Write for BULLETIN 403, Dept. A64

FORMERLY ERIE STEEL CONSTRUCTION COMPANY

ERIE STRAYER CO.

SAME PEOPLE • SAME PRODUCTS • JUST A NEW NAME

564 GEIST ROAD • ERIE, PENNSYLVANIA

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Platform Cars

Single and double-truck to any desired capacity

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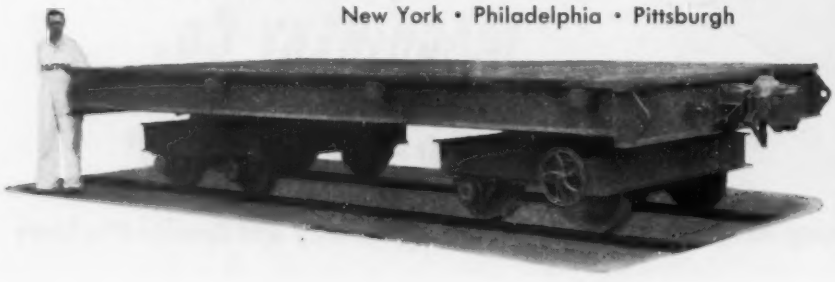


Heavy duty ac welder

Fleetwelder Special is used for a wide range of ac welding production jobs. It has a free circuit reactor control of welding current, separate from the main transformer, adjustable continuously through a wide range of currents. Control is sensitive to various welding conditions and highly responsive to

changing arc conditions. Equally adaptable to sheet steel or heavy plate. Current control mechanism operates through double reduction gear drive with ball bearing shaft to permit rapid current selection with ease and trouble-free operation. Unit has high inbuilt power factor. *Lincoln Electric Co.*

For more data circle No. 55 on postcard, p. 137.

Soldering torch

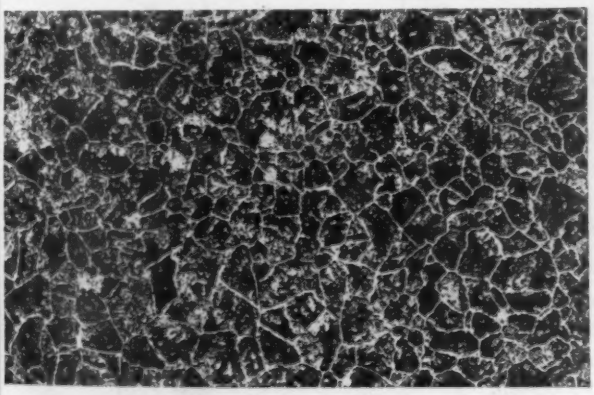
Torch-O-Matic pistol-shaped torch for soldering, burning, sweating and other jobs uses propane gas. A squeeze of the trigger produces a controlled flame—a fine, pin-point or a full, 6-in. flame, as desired for any job. Instant-on, instant-off feature saves time and gas. *Velocity-Power Tool Co.*

For more data circle No. 56 on postcard, p. 137.

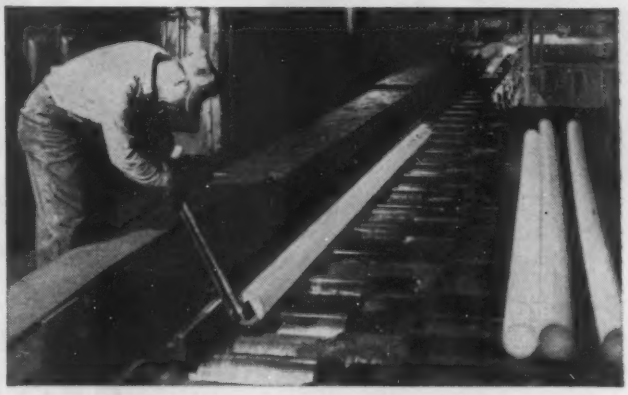
Turn Page

4 reasons why TIMKEN® steel machining bars give you such uniform machinability

1. IN JUST 40 SECONDS this spectrometer tells us the exact chemical composition of a heat of Timken® steel. Results are flashed back to the furnace so the melter can keep close control of the analysis. This carefully-controlled chemistry produces uniform composition from heat to heat—a positive help in maintaining constant machinability.



3. UNIFORM GRAIN SIZE of every heat is assured by spectrometric or microscopic examination. This is another example of the many ways the Timken Company controls uniformity at every step in production.



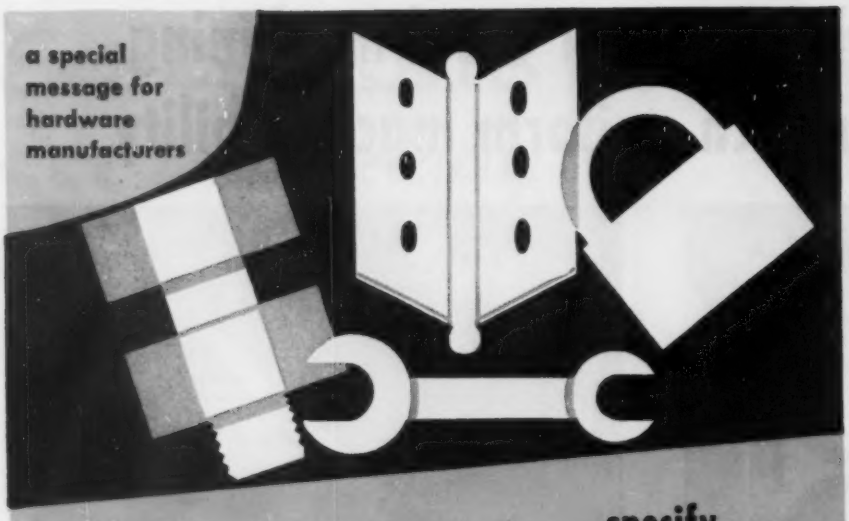
2. INDIVIDUAL HANDLING of each order enables us to adjust our conditioning procedure to suit your machining requirements. Here bars are stamped to identify the heat and ingot they came from. It's one way we can limit variation within an order as well as from order to order.

4. ANY SURFACE DEFECTS are located and removed before your order is rolled to the required bar size. It's one more step we take to make sure Timken steel machining bars give you uniform machinability. To get all these advantages, specify Timken steel machining bars the next time you order. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

TIMKEN
Fine Alloy
STEEL

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



need a finish for protection—decoration—identification? specify IRIDITE®

Specify Iridite . . . for corrosion protection during storage or use . . . for a firm and lasting base for paint . . . for extra quality and eye-appeal . . . for low cost color coding of finished parts.

ON ZINC AND CADMIUM you can get highly corrosion resistant finishes to meet any military or civilian specifications and ranging in appearance from olive drab through sparkling bright and dyed colors.

ON COPPER . . . Iridite brightens copper, keeps it tarnish-free; also lets you drastically cut the cost of copper-chrome plating by reducing the need for buffing.

ON ALUMINUM Iridite gives you a choice of natural aluminum, a golden yellow or dye colored finishes. No special racks. No high temperatures. No long immersion. Process in bulk.

ON MAGNESIUM Iridite provides a highly protective film in deepening shades of brown. No boiling, elaborate cleaning or long immersions.

AND IRIDITE IS EASY TO APPLY. Goes on at room temperature by dip, brush or spray. No electrolysis. No special equipment. No exhausts. No specially trained operators. Single dip for basic coatings. Double dip for dye colors. The protective Iridite coating is not a superimposed film, cannot flake, chip or peel.

WANT TO KNOW MORE? We'll gladly treat samples or send you complete data. Write direct or call in your Iridite Field Engineer. He's listed under "Plating Supplies" in your classified telephone book.

Iridite is approved under government specifications

ALLIED RESEARCH PRODUCTS
INCORPORATED
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Manufacturers of Iridite Finishes for Corrosion Protection and Paint Systems on Non-Ferrous Metals, ARP Plating Chemicals.
WEST COAST LICENSEE: L. H. Butcher Co.

Quality control

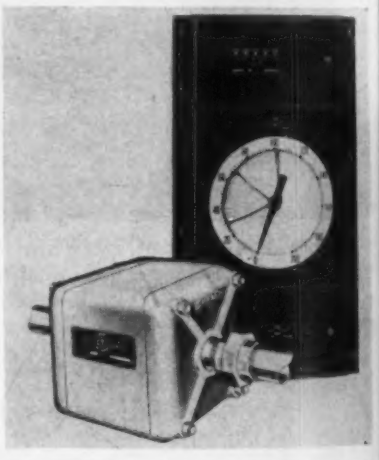
Visual X-ray inspection of many parts and materials can be quickly made at low cost with the new Adrian QC fluoroscope. It can be

used for locating internal defects in plastic, ceramic or light alloy parts; inspection of small assemblies for missing parts or for correct internal alignment of parts. *J. W. Dice Co.*

For more data circle No. 57 on postcard, p. 137.

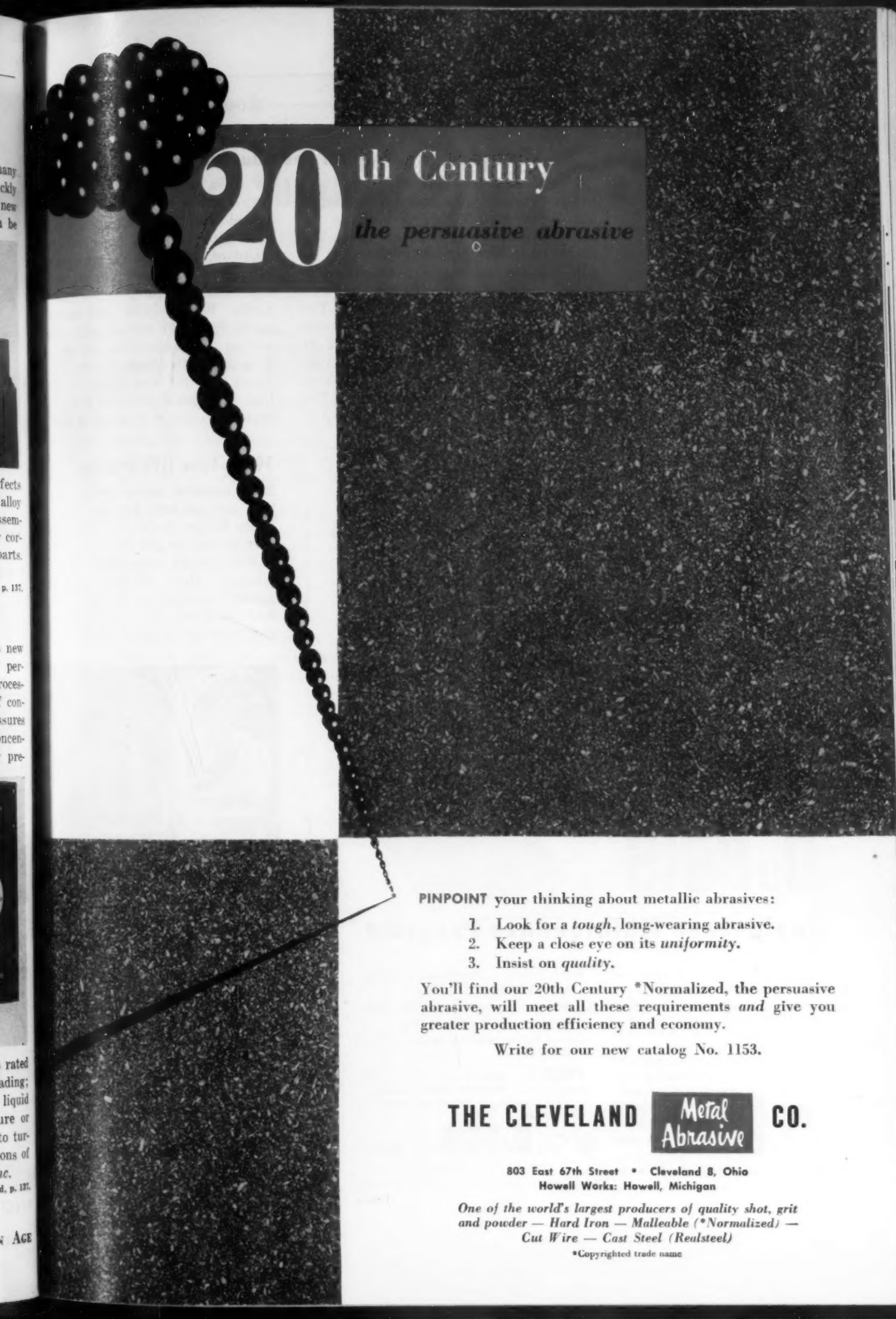
Flow meter

Known as the Xactronic, this new electro-magnetic flow meter permits manufacturers and processors to measure a variety of conducting liquids. High pressures and temperatures or a high concentration of suspended matter pre-



sent no obstacle. Accuracy is rated at 1 pct of the full scale reading; is not affected by changes in liquid viscosity, density, temperature or by transition from laminar to turbulent flow, and by fluctuations of the line voltage. *Bowser, Inc.*

For more data circle No. 58 on postcard, p. 137.
Turn Page



PINPOINT your thinking about metallic abrasives:

1. Look for a *tough*, long-wearing abrasive.
2. Keep a close eye on its *uniformity*.
3. Insist on *quality*.

You'll find our 20th Century *Normalized, the persuasive abrasive, will meet all these requirements *and* give you greater production efficiency and economy.

Write for our new catalog No. 1153.

THE CLEVELAND Metal Abrasive CO.

803 East 67th Street • Cleveland 8, Ohio
Howell Works: Howell, Michigan

*One of the world's largest producers of quality shot, grit and powder — Hard Iron — Malleable (*Normalized) — Cut Wire — Cast Steel (Realsteel)*

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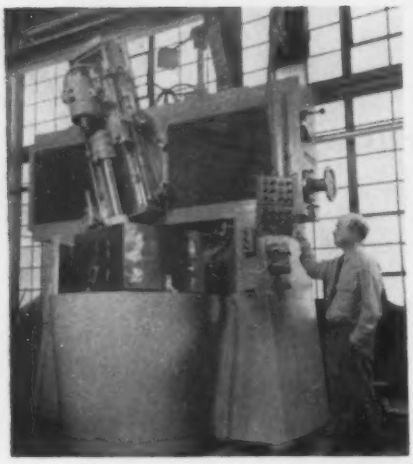
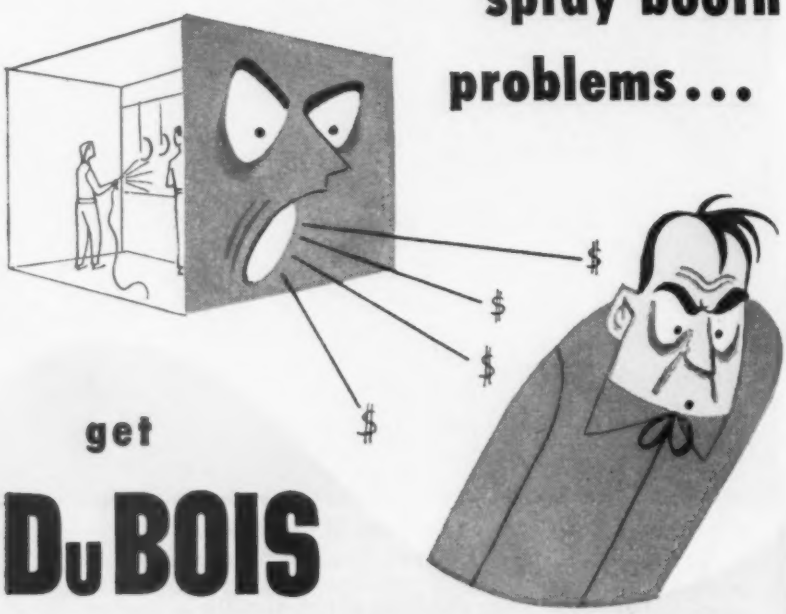


Multiple operation on one chucking

New 42-in. vertical universal grinder, with normal maximum swing of 52 in., is available for precision grinding large parts. The machine, completely hydraulic in operation, does cylindrical grinding of all types—OD, ID, and angle—and also surface grinding. The massive, rugged tool can grind holes, tapered or straight, 2 ft deep. And, with the same setting of the head, it grinds matching male parts for perfect fit. The head can be set at any angle up to 45°. The machine can be furnished with a cross rail, that can be adjusted from 12 to 48 in. above the face plate. While one head is standard, the manufacturer will provide a number of heads and side-heads, according to the user's needs. Work spindle speed ranges up to 88 or 176 rpm in either direction. Grinding head stroke is 27½ in., with speeds to 185 ipm. Rapid traverse has speeds to 100 ipm. *Springfield Machine Tool Co.*

For more data circle No. 59 on postcard, p. 137.

hot weather means spray booth problems...



get

DuBOIS

Engineered Maintenance Program

Actual case histories reveal that each spray booth, if improperly maintained, can cost thousands of unnecessary dollars due to clogged equipment, spoiled production, unreclaimable paint and preventable booth repairs. *DuBois Engineered Maintenance Program guarantees to cut costs* by eliminating these problems through analysis of your operation and the installation of prescribed specialized DuBois compounds:

- KLARIFIANTS . . . water-wash compounds that control overspray.
- FILMITES . . . coatings for dry areas of spray booths.
- PEEL FILMITE . . . flame-proof peelable plastic film.
- STRYPP . . . for periodic purging of old paint deposits in hydraulic system.

Contact DuBois today for details on this complete service.

FREE . . . spray booth maintenance check chart. Write for your weekly-monthly program for proper spray booth maintenance.

The DuBOIS Co., Inc.
Cincinnati 3, Ohio • Los Angeles 33, Calif.
DuBois warehouses and representatives from coast to coast
Dept. G

High-low lift trucks

More operator safety and protection are claimed for an all-new Space-Master Model M. The operator enters the cab from the side. A wrap-around compartment of reinforced steel shields operator against collision. Electric foot brake in compartment allows operator to control braking action without bending knee. Releasing pressure on his left heel applies the brake. Model M has three speeds forward and reverse giving smooth acceleration and deceleration. Dual caster and tandem load wheels provide support to load carrying frame; make high stacking possible. Capacities 2000 and 3000 lb for high lift models. Low lift has 4000 lb capacity. *Lewis-Shepard Products, Inc.*

For more data circle No. 60 on postcard, p. 137.

The Iron Age
FOUNDED 1855
Markets and Prices

THE IRON AGE SUMMARY...

- Consumers starting to step up "hedge" buying
- Mills note some improvement in some products
- Wage negotiations dominate the market outlook

New Business . . . Steel consumers are stepping up their orders to keep from getting caught with their inventories down in event of a strike.

So far this strike-hedge buying is only a minor part of the market. But it has increased noticeably since management and union started discussing what may be the biggest "package" of demands ever presented.

Protective buying was noticed first in tinplate several weeks ago. Since then some automotive buyers have started building their sheet and strip inventories from 30 to 45 days. And various other steel buyers are now showing reawakened concern over their supplies.

This is evidenced by (1) requests to move up some scheduled orders for quicker delivery, (2) repeat orders quicker than had been expected, and (3) a changing attitude of some buyers toward steel salesmen.

Distribution . . . Oil country goods and structurals are still the best sellers in the market. These products should go well for the remainder of the year.

Improvement has recently been noted in plates and galvanized sheets. Government grain bin program and seasonal farm demand are keeping galvanized sheets moving well at mill level, although warehouse sales still lag. Freight car builders are showing a little more interest in plates and structurals than they have in recent months.

Production . . . Steel producers, who have been waging an uphill struggle for business, are not inclined to look a gift horse in the mouth; they'll take all the strike-hedge buying they can get. Since production is now very sensitive to new business, this might edge the operating rate up during the next 30 days.

Outlook . . . Wage negotiations may dominate the steel picture for at least the next month. Consumers will soon be impressed with the potential threat to their supplies when management makes a very modest counter offer to the huge union demands. How much the market improves will depend on how hot the bargaining gets.

Significance . . . If a wage agreement is reached without a strike you can look for a moderate softening of the market during the summer. Last quarter pickup would follow.

Steel Output, Operating Rates

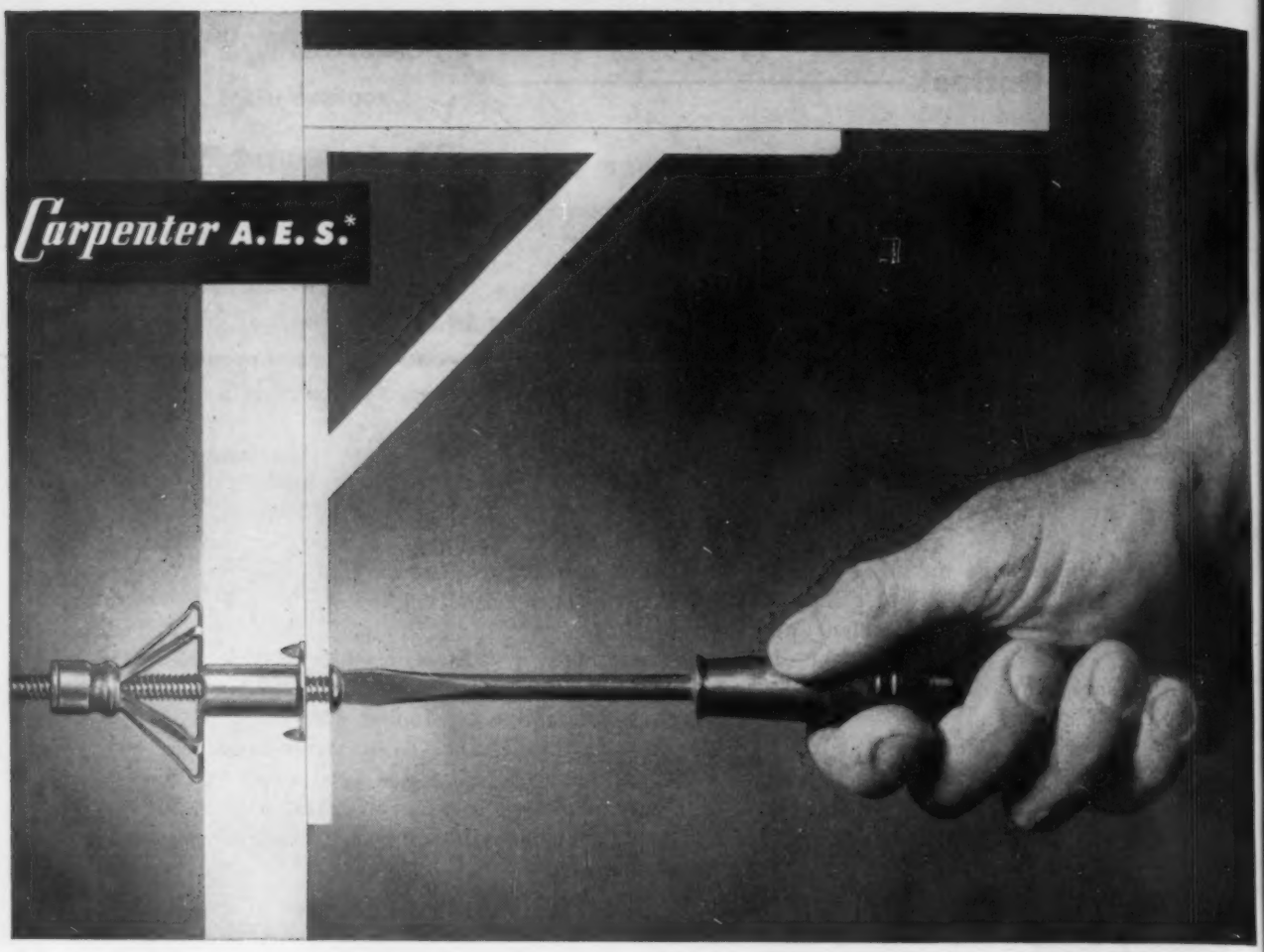
	This Week†	Last Week†	Month Ago	Year Ago
Production (Net tons, 000 omitted)	...	1,680	1,637	2,246
Ingot Index (1947–49=100)	...	104.6	101.9	139.8
Operating Rates				
Chicago	83.0	82.5	79.0	105.5
Pittsburgh	70.0	69.0	68.0	97.0
Philadelphia	59.0	60.0	59.0	98.0
Valley	66.0	67.0*	66.0	102.0
West	76.5	76.0	71.5	107.5
Detroit	83.0	84.0	75.0	108.0
Buffalo	67.5	67.5	67.5	104.5
Cleveland	67.5	67.0*	71.5	98.0
Birmingham	71.0	76.0	56.5	103.5
S. Ohio River	82.5	82.5	80.0	90.0
Wheeling	90.0	90.0	92.0	102.0
St. Louis	34.5	34.5	72.5	89.5
East	31.0	58.5	52.0	90.0
Aggregate	**70.5**	**70.5**	**68.5**	**101.0**

*Revised. †Tentative

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite prices				
Finished Steel, base	4.634	4.634	4.634	4.417
Pig Iron (gross ton)	$56.59	$56.59	$56.59	$55.26
Scrap, No. 1 hvy (gross ton)	$28.58	$28.25	$27.25	$38.83
Nonferrous				
Aluminum, ingot	21.50	21.50	21.50	20.50
Copper, electrolytic	30.00	30.00	30.00	29.875
Lead, St. Louis	13.80	13.80	13.80	13.05
Magnesium, ingot	27.75	27.75	27.75	27.00
Nickel, electrolytic	63.08	63.08	63.08	63.08
Tin, Straits, N. Y.	94.25	94.00	93.50	95.00
Zinc, E. St. Louis	10.50	10.25	10.25	11.00



Help for Handymen at Home

*Another example of how Carpenter *Application Engineering Service is helping industry cut costs.*

Ever try to turn a screw through plaster into a hollow wall? The result is usually disastrous . . . unless a device, such as this patented screw anchor, is used. With this anchor it's an easy matter to drill a hole, insert the device, then turn it tight. And it holds securely. But you'd be surprised at the production problems involved, even with a small item like this. For example, it's a highly competitive product turned out in huge quantities. This means that the tools and dies used to make it have to be just right—they have to hold sharpness, be accurate, provide adequate toughness, and hold up in the presses with no trouble while producing millions of parts.

To help control production costs, the manufacturer called on Carpenter Application Engineering Service for counsel in selecting die steels for the different sections of the progressive dies. A.E.S. supplied the answer—recommended five different steels in the Carpenter Matched Set . . . each engineered to perform its job best. Here, in the manufacturer's words, is the result: "With the help of Carpenter die steels we've been able to control our production costs so closely that there has been no price increase in the last five years!" (A detailed Field Report on the tooling for this job is available on request.)

Time and again, industry is finding new ways to hold costs in line and improve product sales with the help of Carpenter Application Engineering Service. A.E.S. is a service backed by almost 70 years of leadership in specialty steel development. It embraces trained Field Engineers, experienced representatives, competent Mill Metallurgists ready to work with you for best results. A.E.S. starts with your first call to Carpenter. THE CARPENTER STEEL COMPANY, 121 W. Bern St., Reading, Pa.

Carpenter STEEL

Tool, Alloy and Stainless Steels

Pioneering in Improved Tool, Alloy and Stainless Steels Through Continuing Research

Bright Spots May Presage A Pickup

Increased railroad carbuilding boosts morale for plate, structural producers . . . Demand for grain bins perks galvanized sheet market . . . See little strike-hedging.

There were a few potential bright spots in the steel market picture this week. They may not bring about a radical change in the supply-demand situation, but steel sales executives are in a mood to welcome any upturn, however slight.

An inkling of improvement in freight car construction within the past week has boosted the morale of plate and structural producers. This outlet has been practically moribund for months. If the railroads start ordering in quantity, the mills would feel the effects quickly. Indications of a pickup here recalled the statement of one steel official several months ago that railroad car building would make the difference between a fair and a good market in plates this year.

Galvanized Looks Up

Galvanized sheet producers report a strong market due largely to the government grain bin program. This market condition apparently has not yet sifted down to the warehouses, but if things get any tighter, the distributors might be brought into the picture.

Apparently strike-hedge buying has not amounted to enough as yet to result in any appreciable change, although in Detroit a few automakers are increasing their inventories of sheet and strip from 30 to 45 days just in case.

Sheets & Strip . . . As insurance against a possible steel strike, a few automotive companies in Detroit have stepped up their buying for inventory-building purposes. But it has not reached significant proportions. June auto production schedules are good and demand should continue strong through the month. Nevertheless, general market conditions are strongly competitive on basis of reports from production centers. Galvanized demand has improved.

Purchasing Agent's Checklist

TOOLS: Forecasts for good 1954 hold thus far ..... p. 79

FOIL: Kaiser boosts output, see many new uses .....p. 101

WELDING: Steady upturn in view, inventories shrink ..... p. 81

BIG PICTURE: NAPA conclave sees gentle upturn ..... p. 80

Plates . . . A pickup in demand from railroad car builders may give the plate market a long-awaited shot in the arm. Some producers are hinting that any upturn in railroad may be just around the corner. Meanwhile, reports from Pittsburgh indicate that demand for heavy plates continues good. Light plates are hand-to-mouth, but fair. In the East, there was some activity as New York Shipbuilding Co. obtained an order for four large river barges.

Structurals . . . A pickup in railroad car business, if it materializes, would sweeten demand for structurals. Market condition at the moment is spotty but generally good. Demand for wide flange beams is very good, according to reports in Pittsburgh, but buyers are following a more normal order pattern. Letting of a contract for the New Jersey-Pennsylvania Turnpike Link augurs well for future demand.

Bars . . . The market shows little change from last week, when most producing centers reported no sign of a significant upturn in the offing. Detroit reports the bar market is spotty. In the East, the hot-rolled and semi-finished alloy market is off sharply. Cold-finished bar demand has improved in Chicago. Pittsburgh producers look for no great improvement until automobile makers re-enter the market for larger tonnages. This may not happen until third quarter.

Stainless . . . Some producers have made additional extra changes in hot and cold-rolled stainless strip. U. S. Steel Corp.'s latest extra list indicates that width and gage extras on hot-rolled strip (coils only) have been dropped completely. In cold-rolled strip, a drop of 2¢ per lb ($40 per ton) was effected in high tensile extras covering gages 0.030 to under 0.020 in.

Warehouse . . . Story is much the same in PITTSBURGH, CLEVELAND, CHICAGO, DETROIT, the EAST and the WEST COAST: 1) price-cutting is a blight that gives no sign of lifting in the near future; 2) inventories are balanced, top heavy in some items, and 3) fast delivery is more urgent today than in many years. Responsible warehouses are holding firm on prices, but they are losing business to outfits able to pick-up distress steel, particularly sheets, and secondary material for disposal at close to mill price. This competition is being felt to a limited extent in PITTSBURGH on plates, bars, and structurals as well as sheets. Overstocking is largely limited to sheets and galvanized. On delivery, a WEST COAST survey indicated 90 pct goes out in 24 hours after receipt of order, 25 pct is delivered the same day. The reason—competition from mills. Even wide-flange beams are easy in the WEST. Warehouses are in position to handle any inquiry. For instance, a PITTSBURGH outlet booked an order for 91 different items, was able to deliver 90 from own stock, quickly got the other from another source. CHICAGO reports a slight pickup, including sheets and bars. In the EAST, they're crying for business, no longer get carload orders which have returned to the mills. CLEVELAND notes a steady demand for heavy plates in last two months. Some outfits are making out on imported straight bars (40-foot lengths) while others are taking a beating on foreign steel ordered before the decline.

Metals Gain New Market Strength

Better sentiments felt in all major metals . . . Recommend continued tin smelter operation . . . Zinc up ¼¢ on stockpile possibilities . . . Aluminum sales up—By *R. L. Hatschek.*

All of the major nonferrous metals gained further market strength last week. Reasons varied somewhat with tin, lead and zinc all acquiring new bullishness on Washington news of the Texas City smelter, Tariff Commission report and probable stockpiling acceleration.

The Peruvian ambassador has already protested what he termed the recommendation for a 50 pct boost in lead and zinc import tariffs.

Copper and aluminum, also definitely stronger, didn't need this sort of stimulation. Chile seems to be doing a quick job of slimming stocks of red metal. And aluminum sales are mounting to the point where rolling operations are being stepped up by at least one firm.

Tin . . . Threat of being cut off from Malayan tin supplies makes Congress think it ought to authorize government operation of the Texas City, Tex., smelter for another year. The Senate Armed Services Committee voted unanimously to keep the Government-owned smelter operating through June 30, 1955, and Chairman Saltonstall says he knows of no one in the Senate who believes, in view of the present situation in Indochina, that the smelter should be closed down at this time.

The committee agrees to investigate and report by next Mar. 15 on what ought to be done about the smelter. President Eisenhower has recommended that the smelter be closed down as of June 30, in view of the fact that the national stockpile of tin equals a 7-year supply.

Committee's resolution calls for a new study of the adequacy of the stockpile as well as the desirability of a permanent U. S. tin smelting industry. Since Reconstruction Finance Corp., the smelter's operator, is going out of business on June 30, there remains the problem of shifting it to some other agency. Treasury Dept. is the likely choice.

Zinc, Lead . . . Belief that Office of Defense Mobilization would embark shortly on additional lead and zinc stockpiling boosted the zinc price ¼¢ per lb last week to 10.50¢ at East St. Louis. Lead continued fairly firm but without any price change.

MONTHLY AVERAGE PRICES

The average prices of the major nonferrous metals in May, based on quotations appearing in THE IRON AGE were as follows:

	Cents Per Pound
Electrolytic copper, Conn. Valley	30.00
Lake copper, delivered	30.00
Straits tin, New York	93.513
Zinc, East St. Louis	10.290
Zinc, New York	10.790
Lead, St. Louis	13.80
Lead, New York	14.00

NONFERROUS METAL PRICES

(Cents per lb except as noted)

	May 26	May 27	May 28	May 29	May 31	June 1
Copper, electro, Conn.	30.00	30.00	30.00	30.00	....	30.00
Copper, Lake, delivered	30.00	30.00	30.00	30.00	....	30.00
Tin, Straits, New York	93.50	93.75	94.25	....	....	94.25*
Zinc, East St. Louis	10.50	10.50	10.50	10.50	....	10.50
Lead, St. Louis	13.80	13.80	13.80	13.80	....	13.80

Note: Quotations are going prices
*Tentative

Adding further strength to lead and zinc were reports that the Tariff Commission had sent recommendations concerning lead and zinc duties to the White House. Belief prevails that these recommendations are for an increase. The President's decision, which may of course be either way, must be made within 60 days.

Copper . . . The red metal continues firm with further reports that more Chilean copper is being marketed both in Europe and South America. Reports were also heard last week that producers were discussing with the Chilean government the possibility of returning to a 6-day work week. Reason cited was increased demand.

April shipment figures of the secondary brass and bronze ingot industry were healthy indeed. Total for the month was 24,746 tons, up 1100 tons from March and the highest total in the past 12 months. The shipments trend is definitely upward, while a year ago at this time they were declining.

Aluminum . . . Strength is returning to the aluminum market. Recall of 600 workers to Kaiser Aluminum & Chemical Corp.'s Trentwood rolling mill is a further indication. This completes the recall of all workers laid off last winter. And the firm expects to hit peak employment of 3000 during the summer as compared to normal payroll at Trentwood of 2500.

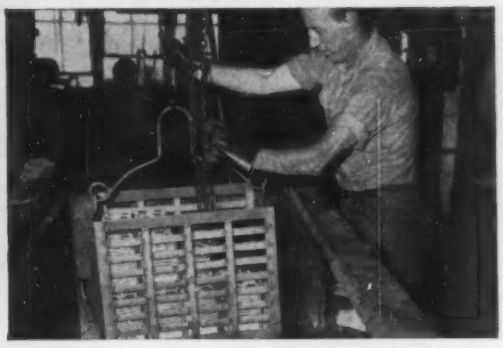
Titanium . . . Race to find a cheap, continuous commercial method for producing titanium continues with United International Research claiming a pair of possibilities. Firm reports it has completed initial pilot operations on electrolysis of titanium dioxide.

Of the two processes, the firm is stressing work on the one which appears more likely to hit semi-commercial possibilities soonest. The other, the firm says, gives indications of cheaper costs but still requires considerable development.

Mercury . . . Supplies of mercury continue very short and prices last week rose to $265 to $268 per 76-lb flask. Each increase now sets a new alltime record. No large quantities are available for early delivery and there seems to be no optimistic sign.

AIRCRAFT. Dependable "Triclene" D assures steady degreaser output even with bulky skin sections. Large stampings emerge thoroughly clean within minutes . . . are instantly ready for next process.

APPLIANCES. "Triclene" D swiftly cuts heavy oils and machining compounds from refrigerator compressor blocks. This rugged solvent is equally effective in conveyorized or manual degreasers.



ELECTRONICS. Cleaning thousands of intricate electronic parts is no problem for speedy, economical "Triclene" D. In less than a minute, every part comes out clean, warm and dry.

Here's why TRICLENE® D is used for fast, thorough vapor degreasing

(*Trichlorethylene*)

THE aircraft, appliance and electronic industries are a few of the hundreds of industries now using Du Pont "Triclene" D trichlorethylene for high-speed vapor degreasing. This modern solvent thoroughly removes the heaviest oils and greases from parts of all shapes and sizes in a matter of minutes—often in seconds!

"Triclene" D can be used in every type of vapor degreasing equipment, whether it's a compact manual unit or a conveyor system operating at rapid production-line speeds. A time-proven product, "Triclene" D is the result of over twenty years' research by Du Pont, pioneer producer of degreasing solvents. It is non-flammable, stable and pure . . . can be easily recovered for economical re-use.

You can't buy a better degreasing solvent than Du Pont's "Triclene" D. And it's fully backed by an experienced technical staff working in the field . . . where you need them! For more information, mail the coupon below or contact one of the Du Pont district offices listed below.

DISTRICT OFFICES: *Boston • Charlotte • Chicago • Cincinnati Cleveland • Detroit • El Monte (Cal.) • New York • Philadelphia.*

TRICLENE® D

(*Trichlorethylene*)

the Rugged Degreasing Solvent

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BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

SEND IN THIS COUPON FOR FREE BOOKLETS

E. I. du Pont de Nemours & Co. (Inc.), IA-63
Electrochemicals Department, Wilmington 98, Delaware

Please send me the literature checked below:

- ☐ "How trichlorethylene is used in metal cleaning."
- ☐ "Triclene" D—an improved vapor degreasing solvent.
- ☐ "Metal degreasing—standard practices."
- ☐ Du Pont publication, "MODERN METAL FINISHING." (Please add my name to the mailing list.)

Name_____ Position_____

Firm_____

Address_____

City_____ State_____

Nonferrous Prices

(Effective June 1, 1954)

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.136 in. and thicker, 2S, 3S, 33.9¢; 4S, 36.0¢; 52S, 38.2¢; 24S-O, 24S-OAL, 37.0¢; 75S-O, 75S-OAL, 44.7¢; 0.081-in., 2S, 3S, 35.1¢; 4S, 37.7¢; 52S, 39.9¢; 24S-O, 24S-OAL, 38.4¢; 75S-O, 75S-OAL, 46.9¢; 0.032-in., 2S, 3S, 37.0¢; 4S, 41.8¢; 24S-O, 24S-OAL, 46.9¢; 75S-O, 75S-OAL, 58.4¢.

Plate, ¼-in. and Heavier: 2S-F, 3S-F, 32.4¢; 4S-F, 34.5¢; 52S-F, 36.2¢; 61S-O, 35.6¢; 24S-O, 24S-OAL, 36.9¢; 75S-O, 75S-OAL, 44.3¢.

Extruded Solid Shapes: Shape factors 1 to 5, 36.5¢ to 82.8¢; 12 to 14, 37.2¢ to 99.0¢; 24 to 28, 39.9¢ to $1.29; 36 to 38, 47.2¢ to $1.89.

Rod, Rolled: 1.064 to 4.5-in., 2S-F, 3S-F, 43.8¢ to 37.2¢; cold-finished, 0.375 to 3.449-in., 2S-F, 3S-F, 47.6¢ to 39.3¢.

Screw Machine Stock: Rounds, 11S-T3, ½ to 11/32-in., 69.6¢ to 47.0¢; ⅜ to 1½-in., 46.6¢ to 43.8¢; 1 9/16 to 3-in., 42.7¢ to 39.9¢. Base 5000 lb.

Drawn Wire: Coiled 0.051 to 0.374-in., 2S, 44.1¢ to 32.4¢; 52S, 53.4¢ to 39.1¢; 17S-T4, 60.1¢ to 41.8¢; 61S-T4, 53.9¢ to 41.3¢.

Extruded Tubing: Rounds, 63S-T5, OD 1¼ to 2-in., 31.6¢ to 60.7¢; 2 to 4 in., 37.7¢ to 51.1¢; 4 to 6 in., 38.2¢ to 46.6¢; 6 to 9 in., 38.7¢ to 48.8¢.

Roofing Sheet: Flat, per sheet, 0.032-in., 42¾ x 60 in., $2.838; x 96 in., $4.543; x 120 in., $5.680; x 144 in., $6.816. Coiled sheet, per lb, 0.019 in. x 28 in., 30.8¢.

Magnesium

(F.o.b. mill, freight allowed)

Sheet & Plate: FS1-O ¼ in., 56¢; 3/16 in., 57¢; ⅛ in., 60¢; 0.064 in., 73¢; 0.032 in., 94¢. Specification grade higher. Base 30,000 lb.

Extruded Round Rod: M, diam ¼ to 0.311 in., 77¢; ½ to ¾ in., 60.5¢; 1¼ to 1.749 in., 56¢; 2½ to 5 in., 51.5¢. Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes: Rectangles: M. In weight per ft, for perimeters less than size indicated; 0.10 to 0.11 lb, 3.5 in., 65.3¢; 0.22 to 0.25 lb, 5.9 in., 62.3¢; 0.50 to 0.59 lb, 8.6 in., 59.7¢; 1.8 to 2.59 lb, 19.5 in., 56.8¢; 4 to 6 lb, 28 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness: OD, ¼ to 5/16 in., $1.43; 5/16 to ⅜ in., $1.29; ½ to ⅝ in., 96¢; 1 to 2 in., 79¢; 0.165 to 0.219 in. wall; OD, ⅝ to ¾ in., 64¢; 1 to 2 in., 60¢; 3 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1½ in., 10,000 lb; 1½ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades; Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $11; Bar, HR or forged, $6; Forgings, $6.

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	86½	67½	92½
Strip, CR	92½	70½	98½
Rod, bar	82½	65½	88½
Angles, HR	82½	65½	88½
Plate, HR	84½	66½	90½
Seamless tube	115½	100½	137½
Shot, blocks	....	60	....

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	46.41	....	48.48
Copper, h-r	48.38	44.73	....
Copper, drawn	....	45.98	....
Low brass	44.47	44.41	....
Yellow brass	41.72	41.66	....
Red brass	45.44	45.38	....
Naval brass	45.76	40.07	41.33
Leaded brass	....	....	39.11
Com. bronze	46.95	46.89	....
Mang. bronze	49.48	43.62	45.18
Phos. bronze	66.58	67.08	....
Muntz metal	43.96	39.77	41.02
Ni silver, 10 pct	55.36	....	62.63

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	21.50
Aluminum pig	20.00
Antimony, American, Laredo, Tex.	28.50
Beryllium copper, per lb conta'd be.	$40.00
Beryllium aluminum 5% Be, Dollars per lb contained Be	$72.75
Bismuth, ton lots	$2.25
Cadmium, del'd	$1.70
Cobalt, 97-99% (per lb)	$2.60 to $2.67
Copper, electro, Conn. Valley	30.00
Copper, Lake, delivered	30.00
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$165 to $175
Lead, St. Louis	13.80
Lead, New York	14.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb, pig	27.00
ingot	27.75
Magnesium, sticks, 100 to 500 lb,	46.00 to 48.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$265 to $268
Nickel electro, f.o.b. N. Y. warehouse	63.08
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	56.25
Palladium, dollars per troy oz.	$21.00
Platinum, dollars per troy oz.	$84 to $87
Silver, New York, cents per oz.	85.25
Tin, New York	94.25
Titanium, sponge, grade A-1	$4.72
Zinc, East St. Louis	10.50
Zinc, New York	11.00
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb delivered carloads)

85-5-5-5 ingot	
No. 115	27.00
No. 120	26.25
No. 123	25.75
80-10-10 ingot	
No. 305	31.50
No. 315	29.25
88-10-2 ingot	
No. 210	41.25
No. 215	37.75
No. 245	33.25
Yellow ingot	
No. 405	23.25
Manganese bronze	
No. 421	26.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	22.50-23.00
0.60 copper, max.	22.25-22.50
Piston alloys (No. 122 type)	20.00-21.25
No. 12 alum. (No. 2 grade)	19.25-19.75
108 alloy	20.00-20.50
195 alloy	21.00-21.50
13 alloy (0.60 copper max.)	22.25-22.50
ASX-679	20.00-20.50

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—96-97½%	20.00-20.50
Grade 2—92-95%	19.00-19.50
Grade 3—90-92%	18.00-18.50
Grade 4—85-90%	17.00-17.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper	
Cast, oval, 15 in. or longer	42.64
Electrodeposited	41.88
Flat rolled	45.04
Brass, 80-20	
Cast, oval, 15 in. or longer	43.515
Zinc, flat cast	20.25
Ball, anodes	18.50
Nickel, 99 pct plus	
Cast	84.00
Cadmium	$1.75
Silver 999 fine, rolled, 100 oz. lots per troy oz., f.o.b. Bridgeport, Conn.	94⅛

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63.00
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	30.00
Nickel chloride, 375 lb drum	38.00
Silver cyanide, 100 oz. lots, per oz.	75½
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	54.30

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	26	25¾
Yellow brass	19¾	18
Red brass	23	22¼
Comm. bronze	23⅞	22⅞
Mang. bronze	18½	17½
Yellow brass rod ends	19⅛	....

Custom Smelters' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	27 —27¼
No. 2 copper wire	25½—25¾
Light copper	24 —24¼
*Refinery brass	22¾—23

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound carload lots, delivered to refinery)

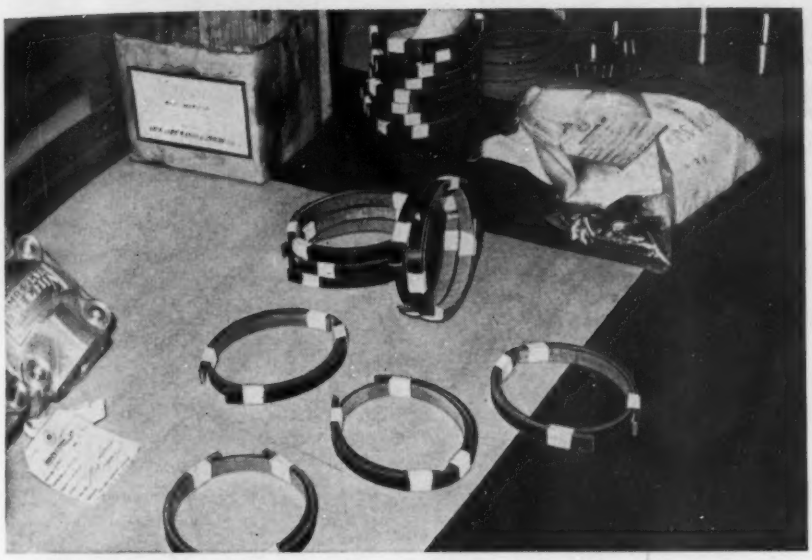
No. 1 copper wire	27 —27¼
No. 2 copper wire	25½—25¾
Light copper	24 —24¼
No. 1 composition	31⅛
No. 1 comp. turnings	30¼
Rolled brass	17⅞
Brass pipe	18½
Radiators	17¼—17½
Aluminum	
Mixed old cast	11½—12½
Mixed new clips	12½—13
Mixed turnings, dry	12½—13
Pots and pans	12 —12½

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	24½—25
No. 2 heavy copper and wire	23 —23½
Light copper	21 —21½
New type shell cuttings	20½
Auto radiators (unsweated)	15
No. 1 composition	19 —19½
No. 1 composition turnings	18½—19
Unlined red car boxes	16
Cocks and faucets	16 —16½
Mixed heavy yellow brass	13
Old rolled brass	15½
Brass pipe	16½—17
New soft brass clippings	17½—18
Brass rod ends	15 —16
No. 1 brass rod turnings	14 —15
Aluminum	
Alum. pistons and struts	7 — 8
Aluminum crankcases	10
2S aluminum clippings	13
Old sheet and utensils	10
Borings and turnings	6 — 7
Misc. cast aluminum	10
Dural clips (24S)	11
Zinc	
New zinc clippings	5½— 6
Old zinc	4½— 5
Zinc routings	2½— 3
Old die cast scrap	2¾— 3
Nickel and Monel	
Pure nickel clippings	60 —65
Clean nickel turnings	40
Nickel anodes	60 —65
Nickel rod ends	60 —65
New Monel clippings	23 —25
Clean Monel turnings	16 —18
Old sheet Monel	21 —23
Nickel silver clippings, mixed	15
Nickel silver turnings, mixed	13
Lead	
Soft scrap lead	11 —11⅛
Battery plates (dry)	5¾— 6
Batteries, acid free	4¼
Magnesium	
Segregated solids	18½—19
Castings	17½—18
Miscellaneous	
Block tin	75 —80
No. 1 pewter	55 —60
No. 1 auto babbitt	46 —48
Mixed common babbitt	12½—13
Solder joints	16½
Siphon tops	48
Small foundry type	15½—15¾
Monotype	13¾—14
Lino. and stereotype	13 —13¼
Electrotype	11¼—11½
Hand picked type shells	8 — 8½
Lino. and stereo. dross	5½— 5¾
Electro dross	3½— 4

POLYKEN tape REDUCES SHIPPING COSTS of shovel & loader parts



A tight wrapping of *Polyken* tape keeps Tractomotive Shovel & Loader hydraulic cylinder packing rings from unwinding—cuts cost of shipping, storage, and handling.

Hydraulic cylinder packing rings for Tractomotive Shovel & Loader are wrapped with *Polyken* for economical shipping and storage at service centers.

Easily holds cumbersome hydraulic cylinder packing rings compactly coiled for Tractomotive Corporation

Packaging and shipping shovel & loader hydraulic cylinder packing rings were a problem for the Tractomotive Corporation. When not coiled, they took up needless space in shipping and storage. But because they are stiff and long and tend to straighten out, they are hard to keep coiled.

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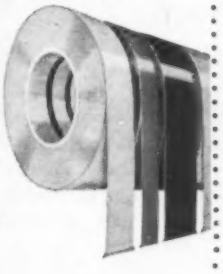

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"Wait and See" Dominates Market

Prices, movement vary in different districts . . . Trader sentiment mixed . . . Uncertain third period steel business, wage negotiations muddle outlook . . . Chicago buying stays strong.

Sentiment in the iron and steel scrap market this week can only be described as mixed. With third quarter steel business still pretty much a question mark and steel labor negotiations in progress, scrap market trends are galloping off in all directions at once.

Pittsburgh traders expected buying and prices to go up, but nothing had materialized at press time. Chicago felt prices should at least level if not break, but they continued to rise. Detroit watched scrap float away to Chicago at higher broker buying prices than local mills would pay for delivered material.

In Ohio, local consumers were claiming they wouldn't buy much in June, but dealers and brokers countered by warning of higher prices when orders materialized. East Coast trading continued sluggish, but prices dipped only in New York, and there only $1 in view of no new business.

Chicago buying raised THE IRON AGE Scrap Composite 33¢ to $28.58 this week, for the eleventh straight week of increase.

Pittsburgh . . . Higher prices for automotive bundles in this area stimulated a wave of bullish thinking in the trade. But brokers and dealers differed on whether higher prices for dealer grades were in the making. The test may come this week when an independent consumer is expected to reenter the market after a long lapse. Meanwhile, quotations are firm but unchanged.

Chicago . . . Despite considerable caution in a large segment of the market, Chicago prices continued to move up in steelmaking and railroad grades and broker buying prices were remaining strong or even moving up. Reinforced by mill sales within the past 2 weeks, it appeared that scrap would not level at prices previously expected. Electric furnace, despite low volume, was again firming in price after reinforcement by several orders for low phos. Turnings were pulled up by a sale in shoveling grades, and bundles continued to attract good prices though quantities moved were not large.

New York . . . Very little scrap was moving in this district as mills waited for new orders and slowed buying against outcome of labor negotiations. A small export shipment was reported at lower prices. Steelmaking grades are off $1 in the face of no demand.

Philadelphia . . . Market here continues to creep along with little change except a feeling of pessimism that is creeping in. Prices on all grades are unchanged with the exception of the dropping of a 50¢ springboard on No. 1 bundles. Heavy melting steel still carries this springboard. Latest report on export is that the boatload scheduled for Philadelphia loading may be shifted to another port.

Detroit . . . Continued invasions from Chicago on automotive scrap lists threw the Detroit market into a turmoil. Counting on low water rates, about $4.50 per ton, Chicago brokers were able to bid more than $29 on track for bundles, a price well over what any Detroit mill is willing to pay for scrap in its own backyard. Without any clear indication of mill intent, Detroit prime steelmaking grades went up $1 in sympathy with list bidding, although resistance to dealer bundles is strong. Turnings and secondary steelmaking grades showed signs of weakness.

Cleveland . . . Prices here and in the Valley remained stable and unchanged. Higher prices being paid for industrial scrap in other areas so far have not counterbalanced general consumer apathy. Most mill buyers indicate they will not take on significant tonnages in June.

Birmingham . . . Most scrap brokers have filled orders for the month and are out of the market. Deliveries are slow, however, and dealers are not pushing to sell. Cast is moving a little more freely in the district at last week's new prices. Some of the larger foundries say they will not meet any further increases. Vacations will start about the middle of June and many foundries plan to shut down during the vacation period so all employees can take vacations at the same time. The two biggest buyers of steel scrap are out of the market.

St. Louis . . . Steel mills in the St. Louis industrial district continue a "wait and see" attitude in their commitments. Buying has been confined to small offerings from established sources. Foundry business generally seems to be improving, with the resultant increase in demand for cast grades and short rails.

Cincinnati . . . All open hearth prices advanced $1 as consumers in adjoining areas issued June buying prices. Turnings were also slightly stronger. Local consumers say they will not buy scrap this month. However if there is local consumption this month prices will probably edge upward. Slow-up in foundry demand has weakened lowphos and drop broken cast.

Buffalo . . . Machine shop turnings edged ahead 50c per ton in a generally steady scrap market here. Outside buying interest is a major market factor. Sentiment among dealers varies from good to bad and some tapering off is noted in recent spirited demand for cast items.

Boston . . . The only two mills in the market for openhearth scrap have now dropped out, reducing demand to practically nil. Prices are nominally held at the earlier level.

West Coast . . . Cupola cast continues especially strong with San Francisco hauling in from southern Idaho at $12 freight. Buying range on new orders up to $42-$44. Seattle area steelmaking scrap market fairly active with one mill allowing $2 freight overage on out-of-area supplies. Range there now: No. 1 heavy melting $23-$25; No. 2 heavy melting $19-$21 and No. 1 bundles $21.50.

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Scrap Prices

(Effective June 1, 1954)

Pittsburgh

No. 1 hvy. melting	$30.00 to	$31.00
No. 2 hvy. melting	28.00 to	29.00
No. 1 bundles	30.00 to	31.00
No. 2 bundles	26.00 to	27.00
Machine shop turn.	15.00 to	16.00
Mixed. bor. and ms. turns.	15.00 to	16.00
Shoveling turnings	19.00 to	20.00
Cast iron borings	19.00 to	20.00
Low phos. punch'gs, plate	33.00 to	34.00
Heavy turnings	28.00 to	29.00
No. 1 RR. hvy. melting	32.00 to	33.00
Scrap rails, random lgth.	37.00 to	38.00
Rails 3 ft and under	43.00 to	44.00
RR. steel wheels	35.00 to	36.00
RR. spring steel	35.00 to	36.00
RR. couplers and knuckles	35.00 to	36.00
No. 1 machinery cast.	43.00 to	44.00
Cupola cast.	37.00 to	38.00
Heavy breakable cast.	31.00 to	32.00

Chicago

No. 1 hvy. melting	$32.00 to	$33.00
No. 2 hvy. melting	29.00 to	31.00
No. 1 factory bundles	33.00 to	35.00
No. 1 dealers' bundles	31.00 to	32.00
No. 2 dealers' bundles	21.00 to	23.00
Machine shop turn.	14.00 to	16.00
Mixed bor. and turn.	14.00 to	16.00
Shoveling turnings	16.00 to	18.00
Cast iron borings	16.00 to	17.00
Low phos. forge crops	37.00 to	38.50
Low phos. punch'gs, plate	33.00 to	35.00
Low phos. 3 ft and under	32.00 to	34.00
No. 1 RR. hvy. melting	33.00 to	35.00
Scrap rails, random lgth.	37.00 to	38.00
Rerolling rails	42.00 to	44.00
Rails 2 ft and under	44.00 to	46.00
Locomotive tires, cut	34.00 to	35.00
Cut bolsters & side frames	36.00 to	37.00
Angles and splice bars	37.00 to	38.00
RR. steel car axles	39.00 to	40.00
RR. couplers and knuckles	35.00 to	36.00
No. 1 machinery cast.	41.00 to	43.00
Cupola cast.	38.00 to	39.00
Heavy breakable cast.	31.00 to	32.00
Cast iron brake shoes	36.00 to	37.00
Cast iron car wheels	34.00 to	35.00
Malleable	40.00 to	42.00
Stove plate	31.00 to	32.00

Philadelphia Area

No. 1 hvy. melting	$22.00 to	$23.50
No. 2 hvy. melting	20.00 to	21.50
No. 1 bundles	23.00 to	24.00
No. 2 bundles	18.00 to	19.00
Machine shop turn.	12.00 to	13.00
Mixed bor. short turn.	14.00 to	15.00
Cast iron borings	14.00 to	15.00
Shoveling turnings	16.00 to	17.00
Clean cast chem. borings.	22.00 to	23.00
Low phos. 5 ft and under	27.00 to	28.00
Low phos. 2 ft and under	28.00 to	29.00
Low phos. punch'gs	28.00 to	29.00
Elec. furnace bundles	24.00 to	25.00
Heavy turnings	21.00 to	22.00
RR. steel wheels	31.00 to	32.00
RR. spring steel	31.00 to	32.00
Rails 18 in. and under	41.00 to	42.00
Cupola cast.	34.00 to	35.00
Heavy breakable cast.	35.00 to	36.00
Cast iron carwheels	38.00 to	39.00
Malleable	38.00 to	39.00
Unstripped motor blocks.	27.00 to	28.00
No. 1 machinery cast.	39.00 to	40.00
Charging box cast.	36.00 to	37.00

Cleveland

No. 1 hvy. melting	$28.00 to	$29.00
No. 2 hvy. melting	25.00 to	26.00
No. 1 bundles	28.00 to	29.00
No. 2 bundles	23.00 to	24.00
No. 1 busheling	28.00 to	29.00
Machine shop turn.	12.00 to	13.00
Mixed bor. and turn.	16.00 to	17.00
Shoveling turnings	16.00 to	17.00
Cast iron borings	16.00 to	17.00
Cut struct'r'l & plate, 2 ft & under	33.50 to	34.50
Drop forge flashings	28.00 to	29.00
Low phos. 2 ft & under	29.00 to	30.00
No. 1 RR. heavy melting	29.00 to	30.00
Rails 3 ft and under	44.00 to	45.00
Rails 18 in. and under	45.00 to	46.00
Railroad grate bars	27.00 to	28.00
Steel axle turnings	19.00 to	20.00
Railroad cast.	41.00 to	42.00
No. 1 machinery cast.	42.00 to	43.00
Stove plate	34.00 to	35.00
Malleable	40.00 to	41.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	$29.00 to	$30.00
No. 2 hvy. melting	24.00 to	25.00
No. 1 bundles	29.00 to	30.00
No. 2 bundles	22.00 to	23.00
Machine shop turn.	14.00 to	15.00
Shoveling turnings	19.00 to	20.00
Cast iron borings	19.00 to	20.00
Low phos. plate	31.00 to	32.00

Buffalo

No. 1 hvy. melting	$26.00 to	$27.00
No. 2 hvy. melting	21.00 to	22.00
No. 1 busheling	26.00 to	27.00
No. 1 bundles	26.00 to	27.00
No. 2 bundles	19.00 to	20.00
Machine shop turn.	14.50 to	15.50
Mixed bor. and turn.	17.50 to	18.50
Shoveling turnings	18.00 to	18.50
Cast iron borings	17.50 to	18.50
Low phos. plate	29.00 to	30.00
Scrap rails, random, lgth.	33.00 to	34.00
Rails 2 ft and under	40.00 to	41.00
RR. steel wheels	34.00 to	35.00
RR. spring steel	34.00 to	35.00
RR. couplers and knuckles	34.00 to	35.00
No. 1 machinery cast.	42.00 to	43.00
No. 1 cupola cast.	39.00 to	40.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$23.00 to	$24.00
No. 2 hvy. melting	19.00 to	20.00
No. 1 bundles, openhearth	25.50 to	26.50
No. 2 bundles	19.00 to	20.00
New busheling	23.00 to	24.00
Drop forge flashings	22.00 to	23.00
Machine shop turn.	9.00 to	10.00
Mixed bor. and turn.	11.00 to	12.00
Shoveling turnings	11.00 to	12.00
Cast iron borings	11.00 to	12.00
Low phos. punch's, plate	24.00 to	25.00
No. 1 cupola cast.		36.00
Heavy breakable cast.		26.00
Stove plate		31.00
Automotive cast.		39.00

St. Louis

No. 1 hvy. melting	$25.00 to	$26.00
No. 2 hvy. melting	23.50 to	24.50
No. 1 bundles	25.00 to	26.00
No. 2 bundles	19.50 to	20.50
Machine shop turn.	12.00 to	13.00
Cast iron borings	13.00 to	14.00
Shoveling turnings	13.00 to	14.00
No. 1 RR. hvy. melting	29.50 to	30.50
Rails, random lengths	39.00 to	40.00
Rails, 18 in. and under	43.00 to	44.00
Locomotive tires, uncut	32.00 to	33.00
Angles and splice bars	31.00 to	32.00
Std. steel car axles	40.00 to	41.00
RR. spring steel	32.50 to	33.50
Cupola cast.	42.00 to	43.00
Hvy. breakable cast.	29.00 to	30.00
Cast iron brake shoes	30.00 to	31.00
Stove plate	37.00 to	38.00
Cast iron car wheels	30.00 to	31.00
Malleable	37.00 to	38.00
Unstripped motors blocks.	27.00 to	28.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$16.00 to	$17.00
No. 2 hvy. melting	14.00 to	15.00
No. 2 bundles	13.00 to	14.00
Machine shop turn.	5.00 to	6.00
Mixed bor. and turn.	7.00 to	8.00
Shoveling turnings	8.00 to	9.00
Clean cast chem. borings.	16.00 to	17.00
No. 1 machinery cast.	35.00 to	36.00
Mixed yard cast.	29.00 to	30.00
Charging box cast.	29.00 to	30.00
Heavy breakable cast.	29.00 to	30.00
Unstripped motor blocks.	22.00 to	23.00

Birmingham

No. 1 hvy. melting		$20.00
No. 2 hvy. melting		18.00
No. 1 bundles		20.00
No. 2 bundles	$15.00 to	16.00
No. 1 busheling		20.00
Machine shop turn.		12.00
Shoveling turnings		15.00
Cast iron borings	13.00 to	14.00
Electric furnace bundles	25.00 to	26.00
Bar crops and plate	29.00 to	30.00
Structural and plate, 2 ft	29.00 to	30.00
No. 1 RR. hvy. melting	26.00 to	27.00
Scrap rails, random lgth.	34.00 to	35.00
Rails, 18 in. and under	37.50 to	38.50
Angles & splice bars	36.00 to	37.00
Rerolling rails	37.00 to	38.00
No. 1 cupola cast.	43.00 to	44.00
Stove plate	40.00 to	41.00
Cast iron car wheels	33.00 to	34.00
Charging box cast.	19.00 to	20.00
Heavy breakable	40.00 to	41.00
Unstripped motor blocks.	34.00 to	35.00
Mashed tin cans	15.00 to	16.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$16.50 to	$17.00
No. 2 hvy. melting	15.00 to	15.25
No. 1 bundles	16.50 to	17.00
No. 2 bundles	13.00 to	13.25
No. 1 busheling	16.50 to	17.00
Elec. furnace, 3 ft & under		17.00
Machine shop turn.	3.00 to	4.00
Mixed bor. and short turn.	5.00 to	6.00
Shoveling turnings	7.00 to	7.50
Clean cast chem. borings.	11.00 to	12.00
No. 1 machinery cast.	27.00 to	29.00
Mixed cupola cast.	26.00 to	27.00
Heavy breakable cast.	23.50 to	24.00
Stove plate	24.00 to	25.00
Unstripped motor blocks.	7.00 to	8.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$26.00 to	$27.00
No. 2 hvy. melting	23.00 to	24.00
No. 1 bundles	26.00 to	27.00
No. 2 bundles	20.00 to	21.00
Machine shop turn.	11.00 to	12.00
Mixed bor. and turn.	13.50 to	14.50
Shoveling turnings	14.00 to	15.00
Cast iron borings	14.00 to	15.00
Low phos., 18 in. & under	32.00 to	33.00
Rails, random lengths	37.00 to	38.00
Rails, 18 in. and under	44.00 to	45.00
No. 1 cupola cast.	38.00 to	39.00
Hvy. breakable cast.	36.00 to	37.00
Drop broken cast.	44.00 to	45.00

San Francisco

No. 1 hvy. melting		$20.00
No. 2 hvy. melting		16.00
No. 1 bundles		19.00
No. 2 bundles		16.00
No. 3 bundles		12.00
Machine shop turn.		5.00
Cast iron borings		9.00
No. 1 RR. hvy. melting		33.00
No. 1 cupola cast	$42.00 to	44.00

Los Angeles

No. 1 hvy. melting		$20.00
No. 2 hvy. melting		16.00
No. 1 bundles		17.00
No. 2 Bundles	$13.50 to	14.00
No. 3 bundles		12.00
Machine shop turn.		5.00
Shoveling turnings	7.00 to	9.00
Cast iron borings	7.00 to	9.00
Elec. fur. 1 ft and under.		25.00
No. 1 RR. hvy. melting		20.00
No. 1 cupola cast.	39.00 to	42.00

Seattle

No. 1 hvy. melting	$23.00 to	$25.00
No. 2 hvy. melting	19.00 to	21.00
No. 1 bundles		21.50
No. 2 bundles		16.00
No. 3 bundles		13.00
No. 1 cupola cast.		37.00
Mixed yard cast.		35.00

Hamilton, Ont.

No. 1 hvy. melting		$22.00
No. 2 hvy. melting		19.00
No. 1 bundles		22.50
No. 2 bundles		19.00
Mixed steel scrap		16.00
Bushelings		17.00
Bush., new fact prep'd.		20.00
Bush., new fact unprep'd.		16.00
Short steel turnings		12.00
Mixed bor. and turn.		12.00
Rails, remelting		31.00
Cast scrap	$42.00 to	45.00

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

(Effective June 1, 1954)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	June 1 1954	May 25 1954	May 4 1954	June 2 1953
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	3.925¢	3.925¢	3.925¢	3.775¢
Cold-rolled sheets	4.775	4.775	4.775	4.575
Galvanized sheets (10 ga.)	5.275	5.275	5.275	5.075
Hot-rolled strip	3.925	3.925	3.925	3.725
Cold-rolled strip	5.513	5.513	5.513	5.20
Plate	4.10	4.10	4.10	3.90
Plates wrought iron	9.30	9.30	9.30	9.00
Stainl's C-R strip (No. 302)	41.50	41.50	41.50	39.75
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$8.95	$8.95	$8.95	$8.95
Tinplate, electro (0.50 lb.)	7.65	7.65	7.65	7.65
Special coated mfg. terns	7.75	7.75	7.75	7.75
Bars and Shapes: (per pound)				
Merchant bars	4.16¢	4.16¢	4.16¢	3.95¢
Cold finished bars	5.22	5.22	5.20	4.925
Alloy bars	4.875	4.875	4.875	4.675
Structural shapes	4.10	4.10	4.10	3.85
Stainless bars (No. 302)	35.50	35.50	35.50	34.00
Wrought iron bars	10.40	10.40	10.40	10.05
Wire: (per pound)				
Bright wire	5.525¢	5.525¢	5.525¢	5.225¢
Rails: (per 100 lb.)				
Heavy rails	$4.325	$4.325	$4.325	$4.075
Light rails	5.20	5.20	5.20	5.00
Semifinished Steel: (per net ton)				
Rerolling billets	$62.00	$62.00	$62.00	$59.00
Slabs, rerolling	62.00	62.00	62.00	59.00
Forging billets	75.50	75.50	75.50	70.50
Alloy blooms, billets, slab	82.00	82.00	82.00	76.00
Wire Rod and Skelp: (per pound)				
Wire rods	4.525¢	4.525¢	4.525¢	4.325¢
Skelp	3.75	3.75	3.75	3.55
Finished Steel Composite: (per pound)				
Base price	4.634¢	4.634¢	4.634¢	4.417¢

	June 1 1954	May 25 1954	May 4 1954	June 2 1953
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$61.19	$61.19	$61.19	$60.69
Foundry, Valley	56.50	56.50	56.50	55.00
Foundry, Southern, Cin'ti	60.43	60.43	60.43	58.93
Foundry, Birmingham	52.88	52.88	52.88	51.38
Foundry, Chicago	56.50	56.50	56.50	55.00
Basic del'd, Philadelphia	60.27	60.27	60.27	59.77
Basic, Valley furnace	56.00	56.00	56.00	54.50
Malleable, Chicago	56.50	56.50	56.50	55.00
Malleable, Valley	56.50	56.50	56.50	55.00
Ferromanganese‡, cents per lb.	10.00¢	10.00¢	10.00¢	9.85¢
‡ 76 pct Mn base.				
Pig Iron Composite: (per gross ton)				
Pig iron	$56.59	$56.59	$56.59	$55.31
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$30.50	$30.50	$29.50	$38.50
No. 1 steel, Phila. area	22.75	22.75	22.75	40.50
No. 1 steel, Chicago	32.50	31.50	29.50	37.50
No. 1 bundles, Detroit	26.00	23.50	22.50	36.50
Low phos., Youngstown	31.50	31.50	31.50	46.50
No. 1 mach'y cast, Pittsburgh	43.50	43.50	43.50	49.50
No. 1 mach'y cast, Philadel'a.	39.50	39.50	39.50	47.50
No. 1 mach'y cast, Chicago	42.00	42.00	41.00	42.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	$28.58	$28.25	$27.25	$38.33
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.38	$14.38	$14.38	$14.75
Foundry coke, prompt	16.75	16.75	16.75	17.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	30.00	30.00	30.00	29.87½
Copper, Lake, Conn.	30.00	30.00	30.00	....
Tin, Straits, New York	94.25†	94.00*	93.50	95.00
Zinc, East St. Louis	10.50	10.25	10.25	11.00
Lead, St. Louis	13.80	13.80	13.80	13.05
Aluminum, virgin ingot	21.50	21.50	21.50	20.50
Nickel, electrolytic	63.08	63.08	63.08	63.08
Magnesium, ingot	27.75	27.75	27.75	27.00
Antimony, Laredo, Tex.	28.50	28.50	28.50	24.50

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

← To identify producers, see Key on p. 187 →

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem *B3*	58.00	58.50	59.00	59.50	.....
Birmingham *R3*	52.38	52.88	.....	.....	.....
Birmingham *W9*	52.38	52.88	.....	.....	.....
Birmingham *S5*	52.38	52.88	.....	.....	.....
Buffalo *R3*	56.00	56.50	57.00	.....	.....
Buffalo *H1*	56.00	56.50	57.00	.....	.....
Buffalo *W6*	56.00	56.50	57.00	.....	.....
Chicago *I4*	56.00	56.50	56.50	57.00	.....
Cleveland *A5*	56.00	56.50	56.50	57.00	61.00
Cleveland *R3*	56.00	56.50	56.50	.....	.....
Daingerfield *L3*	52.50	52.50	52.50	.....	.....
Duluth *I4*	56.00	56.50	56.50	57.00	.....
Erie *I4*	56.00	56.50	56.50	57.00	.....
Everett *M6*	.....	61.25	61.75	.....	.....
Fontana *K1*	62.00	62.50	.....	.....	.....
Geneva, Utah *C7*	56.00	56.50	.....	.....	.....
Granite City *G2*	57.90	58.40	58.90	.....	.....
Hubbard *Y1*	.....	.....	56.50	.....	.....
Minnequa *C6*	58.00	59.00	59.00	.....	.....
Monessen *P6*	56.00	.....	.....	.....	.....
Neville Isl. *P4*	56.00	56.50	56.50	.....	.....
Pittsburgh *U1*	56.00	.....	.....	57.00	.....
Sharpsville *S3*	56.00	56.50	56.50	57.00	.....
Steelton *B3*	58.00	58.50	59.00	59.50	64.00
Swedeland *A2*	58.00	58.50	59.00	59.50	.....
Toledo *I4*	56.00	56.50	56.50	57.00	.....
Troy, N. Y. *R3*	58.00	58.50	59.00	59.50	64.00
Youngstown *Y1*	.....	.....	56.50	57.00	.....
N. Tonawanda *T1*	.....	56.50	57.00	.....	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct., $2 per ton for .05 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 and over.

Silvery Iron: Buffalo, *H1*, $68.25; Jackson, *J1, G1*, $67.00. Add $1.50 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add $1 per ton for 0.75 pct. or more phosphorus. Add 75¢ for each 0.50 pct. manganese over 1.0 pct. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

STAINLESS STEEL

Base price cents per lb., f.a.b. mill

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	16.25	17.25	18.75	18.25	28.00	22.75	24.50	14.00	.....	14.25
Slabs, billets, rerolling	20.50	22.75	24.75	23.75	36.25	29.50	32.25	18.25	.....	18.50
Forg. discs, die blocks, rings	38.50	38.50	41.50	40.50	60.00	45.50	50.75	31.00	31.75	31.75
Billets, forging	29.50	29.75	32.25	31.00	46.50	35.25	39.50	24.00	24.50	24.50
Bars, wires, structurals	35.25	35.50	38.25	37.25	55.50	42.00	46.75	28.75	29.25	29.25
Plates	37.25	37.50	39.75	39.75	58.75	45.75	51.25	30.00	30.50	30.50
Sheets	38.25	41.50	48.75	43.75	62.75	50.50	59.25	34.25	41.25	34.75
Strip, hot-rolled	29.75	32.00	36.75	34.25	53.25	41.00	46.50	26.25	.....	27.00
Strip, cold-rolled	38.25	41.50	45.50	43.75	62.75	50.50	59.25	34.25	41.25	34.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* McKeesport, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Ft. Wayne, *J4.*

Strip: Midland, Pa., *C11;* Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville, Pa., *U2;* Detroit, *M2;* Canton-Massillon, O., *R3;* Middletown, O., *A7;* Harrison, N. J., *D3;* Youngstown, *C5;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (.25¢ per lb higher) *W1* (.25¢ per lb higher); New Bedford, Mass., *R6.*

Bar: Baltimore, *A7;* Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R3;* Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5;* Ft. Wayne, *I4.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2.*

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11.*

Plates: Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15.*

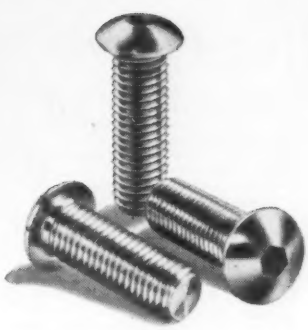
Forged discs, die blocks, rings: Pittsburgh, *C11;* Syracuse, *C11;* Ferndale, Mich., *A3;* Washington, Pa., *J2.*

Forging billets: Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11.*

UNBRAKO **button head socket screws** are used exclusively to assemble this controlled volume pump, which was designed to fill the growing industrial need for the pumping of an allotted quantity of liquid at higher pressures, higher capacities.

The assembler inserts the UNBRAKO button head socket screw with his fingers, and runs it down as far as he can.

He then tightens it with a standard UNBRAKO key. Once seated, the low head design of the UNBRAKO button head provides a smooth, streamlined appearance.



UNBRAKO Button Head Socket Screws are made of heat treated alloy steel; have fully formed threads, Class 3 fit; are available in standard sizes from # 8 to 5/8". Accurate hex socket provides nonslip drive, prevents marring or mutilation of the head.

Save inventory dollars
Use UNBRAKO Standards—stocked by your distributor

Not only does your UNBRAKO distributor lower inventory investment, he also saves you time—and provides latest information about products, cost-saving methods, production techniques, current problems, trade practices. For latest data on UNBRAKO standard socket screw products, consult him or write STANDARD PRESSED STEEL COMPANY, Jenkintown 17, Pennsylvania.

UNBRAKO® **SOCKET SCREW DIVISION**

sps JENKINTOWN PENNSYLVANIA

IRON AGE

STEEL PRICES

(Effective June 1, 1954)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$82.00 *B3*		4.15 *B3*	6.20 *B3*	4.15 *B3*						
	Buffalo, N. Y.	$62.00 *B3*	$75.50 *B3, R3*	$82.00 *B3, R3*	4.925 *B3*	4.15 *B3*	6.30 *B3*	4.15 *B3*	3.925 *B3, R3*	5.45 *B3, R7*	6.00 *B3*	8.425 *B3*		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.								4.05 *A2*		5.90 *A2*			
	New Bedford, Mass.									6.00 *R6*				
	Harrison, N. J.													12.00 *C11*
	Johnstown, Pa.	$62.00 *B3*	$75.50 *B3*	$82.00 *B3*		4.15 *B3*	6.20 *B3*							
	Fairless, Pa.													
	New Haven, Conn.									5.90 *D1* 6.20 *A5*				
	Phoenixville, Pa.					4.15 *P2*		4.15 *P2*						
	Sparrows Pt., Md.								3.925 *B3*	5.45 *B3*	6.00 *B3*	8.425 *B3*		
	Wallingford, Conn.									5.90 *W1*				
	Worcester, Mass.									6.30 *A5*				12.30 *A5* 12.45 *N7*
MIDDLE WEST	Alton, Ill.								4.10 *L1*					
	Ashland, Ky.								3.925 *A7*					
	Canton-Massillon, Dover, Ohio			$82.00 *R3, T5*										12.00 *C9*
	Chicago, Ill.	$62.00 *U1*	$75.50 *R3, U1,W8*	$82.00 *U1, W8,R3*	4.925 *U1*	4.10 *U1, W8*	6.175 *U1, Y1*	4.10 *U1*	3.925 *A1, W8*	5.70 *A1*	5.95 *R3*		6.40 *W8*	
	Cleveland, Ohio		$75.50 *R3*							5.45 *A5, J3*		7.80 *J3* 8.15 *A5*		12.00 *A5* 12.15 *N7*
	Detroit, Mich.			$84.00 *R5*					4.075 *G3* 4.15 *M2*	5.60 *D1,D2, G3,M2,P11*	6.10 *G3*	7.90 *D2* 8.30 *G3*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$62.00 *U1*	$75.50 *U1*	$82.00 *U1, Y1*	4.925 *I3*	4.10 *I3, U1*	6.175 *U1, I3*		3.925 *I3, U1,Y1*	5.70 *I3*	5.95 *U1, I3* 6.45 *Y1*		6.40 *U1*	
	Granite City, Ill.													
	Indianapolis, Ind.									5.60 *C5*				
	Mansfield, Ohio													
	Middletown, Ohio									5.45 *A7*				
	Niles, Warren, Ohio Sharon, Pa.								3.925 *S1*	5.45 *S1,T4*	5.95 *S1*	7.65 *S1*	6.40 *S1*	12.00 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$62.00 *U1, J3*	$75.50 *J3, U1*	$82.00 *U1, C11*	4.925 *U1*	4.10 *J3, U1*	6.175 *J3, U1*	4.10 *U1*	3.925 *A7,P6* 3.95 *S7* 4.425 *S9*	5.45 *B4,J3, S7*		7.80 *J3*	6.40 *S9* 6.45 *S7*	12.00 *S9* 12.15 *S7*
	Portsmouth, Ohio								3.925 *P7*					
	Weirton, Wheeling, Follansbee, W. Va.					4.10 *W3*			3.925 *W3*	5.45 *F3, W3*	5.95 *W3*	8.15 *W3*		
	Youngstown, Ohio			$82.00 *Y1, C10*		4.10 *Y1*	6.675 *Y1*		3.925 *R3, U1,Y1*	5.45 *R3,Y1, C5*	5.95 *U1, R3* 6.45 *Y1*	7.60 *R3* 8.30 *Y1*	6.40 *U1*	12.00 *C5*
WEST	Fontana, Cal.	$70.00 *K1*	$83.50 *K1*	$101.00 *K1*		4.75 *K1*	6.825 *K1*	5.10 *K1*	4.70 *K1*	7.35 *K1*	7.05 *K1*		7.80 *K1*	13.65 *K1*
	Geneva, Utah		$75.50 *C7*			4.10 *C7*	6.175 *C7*							
	Kansas City, Mo.					4.70 *S2*	6.775 *S2*		4.525 *S2*		6.55 *S2*		7.00 *S2*	
	Los Angeles, Torrance, Cal.		$85.00 *B2*	$102.00 *B2*		4.80 *B2, C7*	6.85 *B2*		4.675 *B2, C7*	7.50 *C1*			7.00 *B2*	
	Minnequa, Colo.					4.55 *C6*			5.025 *C6*					
	San Francisco, Niles, Pittsburg, Cal.		$85.00 *B2*			4.75 *B2* 4.91 *P9*	6.80 *B2*		4.675 *B2, C7*					
	Seattle, Wash.		$89.00 *B2*			4.85 *B2*	6.90 *B2*							
SOUTH	Atlanta, Ga.								4.125 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$62.00 *T2*	$75.50 *T2*			4.10 *R3, T2*	6.175 *T2*		3.925 *R3, T2,C16*		5.95 *T2*			
	Houston, Tex.		$83.50 *S2*	$90.00 *S2*		4.50 *S2*			4.325 *S2*				6.90 *S2*	

STEEL PRICES

(Effective June 1, 1954)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

	SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
	Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized *10* ga.	Enameling *12* ga.	Long Terne *10* ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled *19* ga.		Coke* *1.25*-lb. base box	Electro* *0.25*-lb. base box	Hollowware Enameling *29* ga.
Bethlehem, Pa.													
Buffalo, N. Y.	3.925 *B3*	4.775 *B3*				5.90 *B3*	7.225 *B3*			4.525 *W6*			
Claymont, Del.											† Special coated mfg. terne deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb deduct $2.20 from 1.25-lb coke base box. * COKES: 1.50-lb add 25¢. ELECTRO: 0.50-lb add 25¢; 0.75-lb add 65¢; 1.00-lb add $1.20.		
Conshohocken, Pa.	3.975 *A2*					5.90 *A2*							
Harrisburg, Pa.													
Hartford, Conn.													
Johnstown, Pa.										4.525 *B3*			
Fairless, Pa.	3.975 *U1*	4.825 *U1*				5.95 *U1*	7.275 *U1*				$8.80 *U1*	$7.50 *U1*	
New Haven, Conn.													
Phoenixville, Pa.													
Sparrows Pt., Md.	3.925 *B3*	4.775 *B3*	5.275 *B3*			5.90 *B3*	7.225 *B3*	8.075 *B3*		4.625 *B3*	$8.80 *B3*	$7.50 *B3*	
Worcester, Mass.										4.825 *A5*			
Trenton, N. J.													
Alton, Ill.										4.70 *L1*			
Ashland, Ky.	3.925 *A7*		5.275 *A7*	5.175 *A7*									
Canton-Massillon, Dover, Ohio			5.275 *R1, R3*						5.05 *R1*				
Chicago, Joliet, Ill.	3.925 *A1, W8*					5.90 *U1*				4.525 *A5, N4, R3*			
Sterling, Ill.										4.625 *N4*			
Cleveland, Ohio	3.925 *J3, R3*	4.775 *J3, R3*		5.175 *R3*		5.90 *J3, R3*	7.225 *J3, R3*			4.525 *A5*			
Detroit, Mich.	4.075 *G3, M2*	4.925 *G3*				6.05 *G3*	7.375 *G3*						
Newport, Ky.	3.925 *N5*												
Gary, Ind. Harbor, Indiana	3.925 *I3, U1, Y1*	4.775 *I3, U1, Y1*	5.275 *U1, I3*	5.175 *I3, U1*	5.675 *U1*	5.90 *U1, I3* 6.40 *Y1*	7.225 *U1* 7.725 *Y1*				$8.70 *I3, U1, Y1*	$7.40 *I3, U1*	6.10 *U1, Y1*
Granite City, Ill.	4.125 *G2*	4.975 *G2*	5.475 *G2*	5.375 *G2*								$7.60 *G2*	6.30 *G2*
Kokomo, Ind.	4.025 *C9*		5.375 *C9*						5.025 *C9*	4.625 *C9*			
Mansfield, Ohio					5.675 *E2*				5.05 *E2*				
Middletown, Ohio		4.775 *A7*		5.175 *A7*	5.675 *A7*								
Niles, Ohio Sharon, Pa.	3.925 *S1* 5.175 *N3*	5.80 *N3*	5.275 *N3*	6.525 *N3*	5.45 *S1* 5.675 *N3*	5.90 *S1*						$7.40 *R3*	
Pittsburgh, Pa. Midland, Pa. Butler, Pa.	3.925 *J3, U1, P6, A7*	4.775 *J3, U1, P6*	5.275 *U1*	5.175 *U1*		5.90 *J3, U1*	7.225 *J3, U1*	7.925 *U1*		4.525 *A5* 4.725 *P6*	$8.70 *J3, U1*	$7.40 *J3, U1*	6.10 *U1 4*
Portsmouth, Ohio	3.925 *P7*	4.775 *P7*								4.525 *P7*			
Weirton, Wheeling, Follansbee, W. Va.	3.925 *W3, W5*	4.775 *W3, W5, F3*	5.275 *W3, W5*		5.675 *W3, W5*	5.90 *W3*	7.225 *W3*				$8.70 *W3, W5*	$7.40 *W3, W5*	6.10 *F3, W5*
Youngstown, Ohio	3.925 *R3, U1, Y1*	4.775 *R3, Y1*		5.175 *Y1*		5.90 *U1, R3* 6.40 *Y1*	7.225 *R3* 7.725 *Y1*			4.525 *Y1*	$8.70 *R3*		
Fontana, Cal.	4.70 *K1*	5.875 *K1*				6.675 *K1*	8.275 *K1*			5.325 *K1*			
Geneva, Utah	4.025 *C7*												
Kansas City, Mo.									4.775 *C6*	4.865 *S2*			
Los Angeles, Torrance, Cal.	4.625 *C7*		6.275 *C7*							5.325 *B2*			
Minnequa, Colo.										4.775 *C6*			
San Francisco, Niles, Pittsburg, Cal.	4.625 *C7*	5.725 *C7*	6.025 *C7*							5.175 *C7*	$9.45 *C7*	$8.15 *C7*	
Seattle, Wash.													
Atlanta, Ga.													
Fairfield, Ala. Alabama City, Ala.	3.925 *R3, T2*	4.775 *T2*	5.275 *R3, T2*			5.90 *T2*			5.125 *T2* 5.225 *R3*	4.525 *T2 R3*	$8.80 *T2*	$7.50 *T2*	
Houston, Texas	4.325 *S2*									4.925 *S2*			

IRON AGE

STEEL PRICES

(Effective June 1, 1954)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfg'r. Bright
EAST	Bethlehem, Pa.				4.875 *B3*	6.325 *B3*	6.225 *B3*					
	Buffalo, N. Y.	4.15 *B3* 4.18 *R3*	4.15 *B3,R3*	5.25 *B5*	4.875 *B3,R3*	6.325 *B3,B5*	6.225 *B3*	4.10 *B3*			6.25 *B3*	5.525 *W6*
	Claymont, Del.							4.10 *C4*		5.55 *C4*		
	Coatesville, Pa.							4.10 *L4*		5.55 *L4*		
	Conshohocken, Pa.							4.10 *A2*	5.15 *A2*		6.25 *A2*	
	Harrisburg, Pa.							4.10 *C3*	5.15 *C3*			
	Hartford, Conn.			5.70 *R3*		6.775 *R3*						
	Johnstown, Pa.	4.15 *B3*	4.15 *B3*		4.875 *B3*		6.225 *B3*	4.10 *B3*		5.55 *B3*	6.25 *B3*	5.525 *B3*
	Fairless, Pa.	4.30 *U1*	4.30 *U1*		5.025 *U1*							
	Newark, N. J.			5.65 *W10*		6.65 *W10*						
	New Haven, Conn.											
	Camden, N. J.			5.65 *P10*		6.50 *P10*						
	Putnam, Conn.			5.75 *W10*								
	Sparrows Pt., Md.		4.15 *B3*					4.10 *B3*		5.55 *B3*	6.25 *B3*	5.625 *B3*
	Palmer, Worcester, Mansfield, Mass.			5.75 *B5* 6.10 *W11*		6.775 *B5*						5.525 *A5, W6*
	Readville, Mass.			5.75 *C14*								
MIDDLE WEST	Alton, Ill.	4.35 *L1*										5.70 *L1*
	Ashland, Ky.							4.10 *A7*				
	Canton-Massillon, Ohio			5.20 *R3* 5.24 *R3*	4.875 *R3,T5*	6.325 *R2,R3, T5*						
	Chicago, Joliet, Ill.	4.15 *U1, N4,W8* 4.22 *R3*	4.15 *R3,N4*	5.20 *A5,W10, W8,B5,L2*	4.875 *U1, W8,R3*	6.325 *A5,W8, W10,L2, R3,B5*		4.10 *U1,W8*	5.15 *U1*	5.55 *U1*	6.25 *U1*	5.525 *A1, R3,N4,W7*
	Cleveland, Ohio	4.21 *R3*	4.15 *R3*	5.20 *A5,C13*		6.325 *A5, C13*		4.10 *J3,R3*	5.15 *J3*		6.25 *J3*	5.525 *A5, R3,C13*
	Detroit, Mich.	4.30 *R5,G3*		5.35 *R5,P8* 5.40 *B5* 5.45 *P3*	4.975 *R5* 5.025 *G3*	6.425 *R5* 6.475 *P8* 6.525 *B5,P3*	6.375 *G3*	4.25 *G3*			6.40 *G3*	
	Duluth, Minn.											5.525 *A5*
	Gary, Ind. Harbor, Crawfordsville	4.15 *I3, U1, Y1*	4.15 *I3, U1, Y1*	5.27 *R3*	4.875 *I3, U1, Y1*	6.325 *R3,M5*	6.225 *U1,I3* 6.725 *Y1*	4.10 *I3, U1, Y1*	5.15 *I3*	5.55 *U1*	6.25 *U1,I3* 6.75 *Y1*	5.625 *M4*
	Granite City, Ill.							4.30 *G2*				
	Kokomo, Ind.											5.625 *C9*
	Sterling, Ill.	4.25 *N4*	4.25 *N4*									5.625 *N4*
	Niles, Ohio Sharon, Pa.							4.10 *S1*		5.55 *S1*	6.25 *S1*	
	Pittsburgh, Pa. Midland, Pa.	4.15 *J3, U1*	4.15 *J3, U1*	5.20 *A5,C8, J3,W10* 5.26 *R3*	4.875 *U1,C11*	6.325 *A5,C11, W10,C8*	6.225 *J3, U1*	4.10 *J3, U1*	5.15 *U1*	5.55 *U1*	6.25 *J3, U1*	5.525 *A5, J3,P6*
	Portsmouth, Ohio											5.525 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	4.15 *W3*						4.10 *W3*				
	Youngstown, Ohio	4.15 *U1,Y1* 4.20 *R3*	4.15 *R3, U1, Y1*	5.20 *Y1,F2*	4.875 *U1,Y1, C10*	6.325 *Y1, C10,F2*	6.225 *U1* 6.725 *Y1*	4.10 *R3, U1, Y1*			6.75 *Y1*	5.525 *Y1*
WEST	Emeryville, Cal.	4.90 *J5*	4.90 *J5*									
	Fontana, Cal.	4.85 *K1*	4.85 *K1*		5.925 *K1*		7.475 *K1*	4.75 *K1*		6.60 *K1*	6.95 *K1*	
	Geneva, Utah							4.10 *C7*			6.25 *C7*	
	Kansas City, Mo.	4.75 *S2*	4.75 *S2*		5.475 *S2*		6.825 *S2*					6.125 *S2*
	Los Angeles, Torrance, Cal.	4.85 *B2,C7*	4.85 *B2,C7*	6.85 *R3* 6.96 *R3*	5.925 *B2*		6.925 *B2*					6.475 *B2*
	Minnequa, Colo.	4.60 *C6*	4.75 *C6*					4.95 *C6*				5.775 *C6*
	Portland, Ore.	4.90 *O2*										
	San Francisco, Niles, Pittsburg, Cal.	4.85 *C7,P9* 4.90 *B2*	4.85 *C7,P9* 4.90 *B2*				6.975 *B2*					6.475 *C7*
	Seattle, Wash.	4.90 *B2,N6*	4.90 *B2*				6.975 *B2*	5.00 *B2*			7.15 *B2*	
SOUTH	Atlanta, Ga.	4.35 *A8*	4.35 *A8*									5.725 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	4.15 *T2,C16* 4.18 *R3*	4.15 *R3,T2, C16*				6.225 *T2*	4.10 *R3,T2*			6.25 *T2*	5.525 *R3, T2*
	Houston, Ft. Worth, Lone Star, Tex.	4.55 *S2*	4.55 *S2*		5.275 *S2*			4.50 *L3,S2*				5.925 *S2*

Steel Prices

(Effective June 1, 1954)

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, New York
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Glube Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Co., Inc., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sloss Sheffield Steel & Iron Co., Birmingham
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Sweet's Steel Co., Williamsport, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co., Fort Worth

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Fred Ulbrich & Sons, Wallingford, Conn.

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wycoff Steel Co., Pittsburgh
W11 Worcester Pressed Steel Co., Worcester, Mass.

Y1 Youngstown Sheet & Tube Co., Youngstown

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $280 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	24.25	8.0	27.25	12.0	29.75	15.5	32.25	16.5	32.75	17.5	33.25	18.0	34.75	18.0								
Youngstown *R3*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Fontana *K1*	13.25	+2.0	16.25	1.0	18.75	4.5	21.25	5.5	21.75	6.5	22.25	7.0	23.75	7.0								
Pittsburgh *J3*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Alton, Ill. *L1*	24.25	8.0	27.25	12.0	29.75	15.5	32.25	16.5	32.75	17.5	33.25	18.0	34.75	18.0								
Sharon *M3*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Fairless *N2*	24.25	.....	27.25	.....	29.75	.....	32.25	.....	32.75	.....	33.25	.....	34.75	.....								
Pittsburgh *N1*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Wheeling *W5*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Wheatland *W4*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Youngstown *Y1*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Indiana Harbor *Y1*	25.25	9.0	28.25	13.0	30.75	16.5	33.25	17.5	33.75	18.5	34.25	19.0	35.75	19.0								
Lorain *N2*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	27.75	13.0	31.75	17.0	33.75	20.5	34.25	19.5	34.75	20.5	35.25	21.0	35.75	20.0								
Youngstown *R3*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Fontana *K1*	16.75	.....	20.75	.....	22.75	.....	23.25	.....	23.75	.....	24.25	.....	24.75	.....								
Pittsburgh *J3*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Alton, Ill. *L1*	27.75	13.0	31.75	17.0	33.75	20.5	34.25	19.5	34.75	20.5	35.25	21.0	35.75	20.0								
Sharon *M3*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Pittsburgh *N1*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Wheeling *W5*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Wheatland *W4*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Youngstown *Y1*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Indiana Harbor *Y1*	28.75	14.0	32.75	18.0	34.75	21.5	35.25	20.5	35.75	21.5	36.25	22.0	36.75	21.0								
Lorain *N2*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75

Galvanized discounts based on zinc, at 11¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1c. Threads only buttweld and seamless, 2¼ pts. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 4½ pts. higher discount. Buttweld jobbers' discount, 5 pct. East St. Louis zinc price now 10.50¢.

Steel Prices

(Effective June 1, 1954)

To identify producers, see Key on preceding page.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *Ul*	4.325	5.20	5.275	.....	.....	.....	.....
So. Chicago *R3*	.....	.....	.....	7.05	.....	.....	.....
Cleveland *R3*	.....	.....	.....	.....	.....	.....	.....
Emsley *T2*	4.325	5.20	.....	.....	.....	.....	.....
Fairfield *T2*	.....	5.20	.....	7.05	.....	5.125	.....
Gary *Ul*	4.325	5.20	.....	.....	.....	5.125	.....
Ind. Harbor *I3*	4.325	.....	5.275	7.05	.....	5.125	.....
Johnstown *B3*	.....	5.20	.....	.....	.....	.....	.....
Joliet *Ul*	.....	5.20	5.275	.....	.....	.....	.....
Kansas City *S2*	.....	.....	.....	7.30	.....	.....	11.00
Lackawanna *B3*	4.325	5.20	5.275	.....	.....	5.125	.....
Lebanon *B3*	.....	.....	.....	7.05	10.50	.....	11.00
Minnequa *C6*	4.325	5.70	5.275	7.05	.....	5.125	11.00
Pittsburgh *O1*	.....	.....	.....	.....	10.50	.....	11.00
Pittsburgh *P5*	.....	.....	.....	.....	10.50	.....	11.00
Pittsburgh *J3*	.....	.....	.....	7.05	.....	.....	.....
Pitt'g, Cal. *C7*	.....	.....	.....	.....	.....	5.275	.....
Seattle *B7*	.....	.....	.....	7.55	.....	5.275	11.50
Steelton *B3*	4.325	.....	5.275	.....	.....	5.125	.....
Struthers *Y1*	.....	.....	.....	.....	.....	.....	.....
Torrance *C7*	.....	.....	.....	.....	.....	5.275	.....
Youngstown *R3*	.....	.....	.....	7.05	.....	.....	.....

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Cold-Reduced (Coiled or Cut Length) Fully Processed
Field	.....	8.05	.....
Armature	8.15	8.40	8.90
Elect.	8.75	9.00	9.50
Motor	9.75	10.00	10.50
Dynamo	10.65	10.90	11.40
Trans. 72	11.60	11.85	12.35
Trans. 65	12.15	Grain Oriented	
Trans. 58	12.65	Trans. 80	16.25
Trans. 52	13.65	Trans. 73	16.75

Producing points: Beech Bottom (*W5*); Brackenridge (*A5*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville (*A7*).

* Coils 75¢ higher.

CLAD STEEL

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa., *L4*	*32.7	
Washington, Pa., *J2*	....	
Claymont, Del., *C4*	....	
New Castle, Ind., *I2*	....	32.50
Nickel-carbon		
10 pct. Coatesville, Pa., *L4*	37.5	
Inconel-carbon		
10 pct., Coatesville, Pa., *L4*	46.10	
Monel-carbon		
10 pct. Coatesville, Pa., *L4*	38.90	

* Includes annealing and pickling, sandblasting.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Col	Woven Wire Fence 9-15½ ga. Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire* Galv. ¢/lb.
Alabama City *R3*	131	140	...	149	153	6.675	7.075
Aliquippa, Pa. *J3*	131	143	...		150	6.675	7.20
Atlanta *A8*	133	145	...	151	158	6.775	7.30
Bartonville *K2*	133	145	...	151	158	6.775	7.30
Buffalo *W6*	.....	.....	.....	.....	.....	.....	.....
Chicago, Ill. *N4*	131	143	...	149	156	6.675	7.20
Cleveland *A6*	137	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	6.675	.....
Crawfordsville *M4*	133	145	...	151	153	6.775	7.325
Donora, Pa. *A5*	131	140	...	149	153	6.675	7.075
Duluth *A5*	131	140	145	149	153	6.675	7.075
Fairfield, Ala. *T2*	131	140	...	149	153	6.675	7.075
Galveston *D4*	139	148	.....	.....	.....	.....	.....
Houston *S2*	139	148	.....	.....	161	7.075	7.475
Johnstown, Pa. *B3*	131	143	145	.....	156	6.675	7.225
Joliet, Ill. *A5*	131	140	...	149	153	6.675	7.075
Kokomo, Ind. *C9*	133	142	...	151	155	6.775	7.175
Los Angeles *B2*	.....	.....	.....	.....	7.625	.....	.....
Kansas City *S2*	143	152	...	161	165	7.275	7.675
Minnequa *C6*	136	148	150	154	162	6.925	7.325
Monessen *P6*	131	145	.....	.....	157	6.675	7.225
Moline, Ill. *R3*	.....	.....	145	.....	.....	.....	.....
Pittsburgh, Cal. *C7*	150	163	...	173	173	7.625	8.025
Portsmouth *P7*	.....	.....	.....	.....	.....	6.675	.....
Rankin, Pa. *A5*	131	140	.....	.....	153	6.675	7.075
So. Chicago *R3*	131	140	145	149	153	6.675	7.075
S. San Francisco *C6*	.....	.....	.....	.....	173	.....	.....
Sparrows Pt. *B3*	133	.....	.....	151	158	6.775	7.325
Struthers, O. *Y1*	.....	.....	.....	.....	.....	6.675	7.175
Worcester *A5*	137	.....	.....	.....	.....	6.975	.....
Williamsport, Pa. *S10*	133	...	158	.....	.....	.....	.....

Cut Nails, carloads, base $8.00 per keg (loss 20¢ to jobbers), at Conshohocken, Pa. (*A2*).

* Alabama City and So. Chicago don't include zinc extra. Galvanized products computed with zinc at 11.0¢ per lb.

WAREHOUSES

Base price, f.o.b., dollars per 100 lb.

Cities	City Delivery Charge	Sheets: Hot-Rolled	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)	Strip: Hot-Rolled	Strip: Cold-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled	Bars: Cold-Finished	Alloy Bars: Hot-Rolled A-4615 As rolled	Alloy Bars: Hot-Rolled A-4140 Annealed	Alloy Bars: Cold-Drawn A-4615 As rolled	Alloy Bars: Cold-Drawn A-4140 Annealed
Baltimore	$.20	6.20	7.12	7.36–7.78	7.00	.....	6.85	6.98	6.86	8.17	.....	.....	.....	.....
Birmingham	.15	6.10	7.00	8.00[4]	6.30	.....	6.35	6.35	6.15	8.90	.....	.....	.....	.....
Boston	.20	6.89	7.83–8.38	9.18	7.13	9.35[2]	7.13	7.06	6.87	8.35	12.40	11.94–12.28	14.65	14.55–14.58
Buffalo	.20	6.18–6.20	7.15	8.70	6.65–6.79	.....	6.65–6.68	6.55–6.59	6.35	7.70	.....	11.95–12.15	14.45	14.25–14.55
Chicago	.20	6.18	7.12	7.95	6.42	.....	6.33	6.46	6.28	7.30	.....	11.60	.....	14.05
Cincinnati	.20	6.30	7.11	.....	6.66	.....	6.62	6.93	6.52	7.60	.....	11.85	.....	14.30
Cleveland	.20	6.18	7.12	8.25	6.58	.....	6.50	6.79	6.34	7.40	12.04	11.74	14.29	14.19
Denver	.....	7.95	8.85	10.45–10.47	8.20	9.55	7.95	7.95	8.05	9.05	.....	.....	.....	15.75
Detroit	.20	6.35–6.45	7.29–7.31	8.42	6.68–7.71	7.36	6.80	6.91–6.93	6.56	7.60	12.47	11.92	14.42	13.44–14.62
Houston	.20	7.15	7.45–7.60	9.23	7.45	.....	7.20	7.35	7.45	9.30–9.40	.....	12.80	.....	.....
Kansas City	.20	6.85	.....	.....	7.09	.....	7.00	7.13	6.95	8.07	.....	.....	.....	.....
Los Angeles	.20	7.25	9.00	8.85–9.75	7.55	.....	7.20	7.35	7.15	9.10–9.75	.....	12.90	.....	15.90
Memphis	.10	6.79	7.69	.....	6.90	.....	7.01	7.09	6.83	7.89–8.76	.....	.....	.....	.....
Milwaukee	.20	6.35	7.29	8.17	6.59	.....	6.50	6.63	6.45	7.57	.....	11.77	.....	14.22
New Orleans	.15	6.51	7.41	.....	6.63	.....	6.73	6.81	6.60	8.37	.....	.....	.....	.....
New York	.30	6.78	7.75–8.37	8.37–8.41[7]	7.16	9.15[3]	6.99	6.90	7.06	8.43	12.29	11.99	14.54	14.44
Norfolk	.20	6.90	.....	.....	7.00	.....	7.00	7.00	7.00	8.50	.....	.....	.....	.....
Philadelphia	.25	6.35–6.53	7.13	7.87	7.02	.....	6.63	6.67	6.87	8.19	.....	11.74	.....	14.19
Pittsburgh	.20	6.18	7.12	8.00	6.55	.....	6.33	6.46	6.28	7.65	.....	11.60	.....	14.05
Portland	.10	7.60–8.75	8.45–9.75	9.05	7.65	.....	7.30	7.25	7.35	10.65	.....	.....	.....	.....
Salt Lake City	.20	8.60	10.50	10.50[3]	9.25	.....	8.10	8.25	9.20	11.25	.....	.....	.....	.....
San Francisco	.20	7.35	8.70	9.80	7.60	.....	7.20	7.25	7.15	9.75	.....	12.90	.....	15.90
Seattle	.20	7.95–8.15	9.30–9.50	9.80	7.80–8.00	.....	7.40–7.60	7.30–7.50	7.40–7.60	10.45–10.65	.....	13.15	.....	15.60
St. Louis	.20	6.48	7.42	8.25–8.30	6.72	7.70–8.53	6.73	6.86	6.58	7.70	12.20	11.90	14.45	14.30–14.35
St. Paul	.15	6.84	7.78–8.33	8.61	7.08	13.22	6.99	7.12	6.94	8.06	.....	12.42	.....	.....

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

Exceptions: (1)500 to 1499 lb. (2)20,000 lb or over. (3)450 to 1499 lb. (4)500 to 9999 lb. (5)1000 lb or over. (6)400 to 1499 lb. (7)1500 to 3499 lb. (8)2000 to 5999 lb.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Bridgeport, Conn. *S7**	5.75	7.65	8.60	10.55	12.85
Carnegie, Pa. *S9*	.....	7.65	8.60	10.55	12.85
Cleveland *A5*	5.45	7.65	8.60	10.55	12.85
Detroit *D1*	5.65	7.85	8.80	10.55	.....
Detroit *D2*	5.60	7.85	8.80	.....	.....
Harrison, N. J. *C11*	.....	.....	8.90	10.85	13.15
Indianapolis *C5*	5.60	7.80	8.60	10.55	.....
New Castle, Pa. *B4*	5.80	8.00	8.60	.....	.....
New Haven, Conn. *D1*	5.90	7.95	8.90	10.85	.....
Riverdale, Ill. *A1*	5.70	7.80	8.75	10.70	13.00
Buffalo, N. Y. *R1*	5.45	7.65	8.60	10.55	12.85
Sharon, Pa. *S1*	5.45	7.65	8.60	10.55	12.85
Trenton *R4*	.....	7.95	8.90	10.85	13.15
Wallingford *W1*	6.20	7.95	8.90	10.85	13.15
Warren, Ohio *T4*	5.45	7.65	8.60	10.55	12.85
Weirton, W. Va. *W3*	5.45	7.65	8.60	10.55	12.85
Worcester, Mass. *A5*	6.30	7.95	8.90	10.85	13.15
Youngstown *C5*	5.45	7.65	8.60	10.55	.....

* Sold on Pittsburgh base.

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	27.34	32.98	26.51	31.98
	2½	12	36.82	44.41	35.70	43.07
	3	12	42.52	51.28	41.23	49.73
	3½	11	49.63	59.87	48.13	58.06
	4	10	65.91	79.50	63.92	77.10
National Tube	2	13	.....	32.98	26.51	.....
	2½	12	36.82	44.41	35.70	.....
	3	12	42.52	51.28	41.23	.....
	3½	11	49.63	59.87	48.13	.....
	4	10	65.91	79.50	63.92	.....
Pittsburgh Steel	2	13	27.34	32.98	.....	.....
	2½	12	36.82	44.41	.....	.....
	3	12	42.52	51.28	.....	.....
	3½	11	49.63	59.87	.....	.....
	4	10	65.91	79.50	.....	.....

Miscellaneous Prices

(Effective June 1, 1954)

TOOL STEEL

F.o.b. Mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.48
18	4	1	—	5	2.16
18	4	2	—	—	1.64
18	4	1.5	8	—	.895
1.5	4	2	6	—	1.005
6	4				.70

High-carbon chromium ..... .70
Oil hardened manganese ..... .39
Special carbon ..... .355
Extra carbon ..... .30
Regular carbon ..... .25

Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.

CAST IRON WATER PIPE

	Per Net Ton
6 to 24-in., del'd Chicago	$111.80 to $115.20
6 to 24-in., del'd N. Y...	115.00 to 116.00
6 to 24-in., Birmingham	98.00 to 102.50

6-in. and larger f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less .....$129.50 to $131.50

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective July 1, 1953, to end of 1954 season.

	Gross Ton
Openhearth lump	$11.15
Old range, bessemer	10.30
Old range, nonbessemer	10.15
Mesabi, bessemer	10.05
Mesabi, nonbessemer	9.90
High phosphorus	9.90

Prices based on upper Lakes rail freight rates, Lake vessel freight rates, handling and unloading charges, and taxes thereon, in effect on June 24, 1953. Increases or decreases after such date are for buyer's account.

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.25 to $14.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$16.50 to $17.00
Foundry, oven coke	
Buffalo, del'd	$28.08
Chicago, f.o.b.	24.50
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.00
Philadelphia, f.o.b.	23.95
Swedeland, Pa., f.o.b.	23.85
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	23.75
St. Louis, f.o.b.	26.00
Birmingham, f.o.b.	22.65
Lone Star, Tex., f.o.b.	18.50

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed

GRAPHITE			CARBON		
Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)	Price
24	84	20.50	40	100, 110	8.95
20	72	20.00	35	110	8.95
12 to 18	72	20.50	30	110	8.95
7 to 10	60	21.00	24	72 to 84	9.10
8	60	23.25	20	90	8.95
4	40	28.00	17	72	9.10
3	40	27.25	14	72	9.50
2½	30	28.00	10, 12	60	10.30
2	24	43.50	8	60	10.55

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Nuts, Hot Pressed, Cold Punched—Sq.

Pct Off List

	Less Keg Reg.	K.	Less Keg Hvy.	K.
½ in. & smaller	+2	15	+2	15
9/16 in. & ⅝ in.	+7	11	+32*	+10*
¾ in. to 1½ in. inclusive	+8	10	+27**	+6**
1⅝ in. & larger	+9	9	+27	+6

* 9/16 to ¾ in.
** ⅞ to 1½ in.

Nuts, Hot Pressed—Hexagon

½ in. & smaller	11	26	8	23
9/16 in. & ⅝ in.	2	13	+20	net
¾ in. to 1½ in. inclusive	+6	13	+25	+4
1⅝ in. & larger	+8	10	+25	+4

Nuts, Cold Punched—Hexagon

½ in. & smaller	11	26	8	23
9/16 in. & ⅝ in.	9	24	+2	15
¾ in. to 1½ in. inclusive	+1	16	+9	9
1⅝ in. & larger	+16	8	+20	net

Nuts, Semi-Finished—Hexagon

½ in. & smaller	23	36	14	28
9/16 in. & ⅝ in.	18	32	4	20
¾ in. to 1½ in. inclusive	8	33	+8	10
1⅝ in. & larger	+14	5	+30	net

Light		
7/16 in. & smaller	33	43
½ in. thru ⅝ in.	26	37
¾ in. to 1½ in. inclusive	18	30

Stove Bolts

Pct Off List

Packaged, steel, plain finished 44½—10
Packaged, plain finish ..... 25½—10
Bulk, plain finish** 59*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets

Base per 100 lb

½ in. & larger $8.90

Pct Off List

7/16 in. and smaller 30

Cap and Set Screws

(In bulk) *Pct Off List*

Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright 40
¾ in. thru 1 in. up to & including 6 in. 26
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat 43
¾ in. thru 1 in. up to & including 6 in. 33
Milled studs 17
Flat head cap screws, listed sizes ... 12
Fillister head cap, listed sizes 7
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter 37

Machine and Carriage Bolts

Pct Off List

	Less Case	C.
½ in. & smaller x 6 in. & shorter	4	20
9/16 in. & ⅝ in. x 6 in. & shorter	5	21
¾ in. & larger x 6 in. & shorter	3	19
All diam. longer than 6 in...	+4	13
Lag, all diam. x 6 in. & shorter	12	27
Lag, all diam. longer than 6 in.	3	23
Plow bolts	30	..

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00) ..$109.00
No. 1 Ohio 102.00
Sec. quality, Pa., Md., Ky., Mo., Ill. 102.00
No. 2 Ohio 93.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50) 16.00

Silica Brick

Mt. Union, Pa., Ensley, Ala $115.00
Childs, Hays, Pa. 120.00
Chicago District 125.00
Western Utah 131.00
California 138.00
Super Duty Hays, Pa., Athens, Tex., Windham 132.00
Curtner, Calif. 150.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 19.00
Silica cement, net ton, bulk, Hays, Pa. 21.00
Silica cement, net ton, bulk, Chicago District, Ensley, Ala. 20.00
Silica cement, net ton, bulk, Utah and Calif. 28.50

Chrome Brick

Per net ton

Standard chemically bonded Balt.. $86.00
Standard chemically bonded, Curtner, Calif. 96.25
Burned, Balt. 80.00

Magnesite Brick

Standard Baltimore $109.00
Chemically bonded, Baltimore 97.50

Grain Magnesite

St. ⅝-in. grains

Domestic, f.o.b. Baltimore in bulk fines removed $64.40
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk 38.04
in sacks 43.75

Dead Burned Dolomite

Per net ton

F.o.b., bulk, producing points in: Pa., W. Va., Ohio $14.50
Midwest 14.60
Missouri Valley 13.68

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; Effective CaF_2 content

72½% $44.00
70% or more 42.50
60% or less 38.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron, c.i.f. New York, ocean bags ... 11.25¢
Canadian sponge iron, del'd. in East ..... 12.0¢
Domestic sponge iron, 98+% Fe, carload lots ..... 18.0¢
Electrolytic iron, annealed, 99.5+% Fe ..... 44.0¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe 60.0¢
Hydrogen reduced iron minus 300 mesh, 98+% Fe..63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe..83.0¢ to $1.43
Aluminum ..... 31.5¢
Brass, 10 ton lots .....29.50¢ to 36.50¢
Copper, electrolytic ..... 43.50¢
Copper, reduced ..... 43.50¢
Cadmium, 100-199 lb 95¢ plus metal value
Chromium, electrolytic, 99% min., and quality, del'd... $3.60
Lead ..... 21.00¢
Manganese ..... 57.0¢
Molybdenum, 99% $2.75
Nickel, unannealed ..... 89.50¢
Nickel, annealed ..... 96.50¢
Nickel, spherical, unannealed 93.50¢
Silicon ..... 43.50¢
Solder powder..7.0¢ to 9.0¢ plus met. value
Stainless steel, 302 ..... 91.0¢
Stainless steel, 316 ..... $1.10
Tin .....14.04¢ plus metal value
Tungsten, 99% (65 mesh) .. $4.65
Zinc, 10 ton lots .....17.5¢ to 25.0¢

Ferroalloy Prices

(Effective June 1, 1954)

Ferrochrome

Contract prices, cents per lb contained Cr, lump size, bulk, in carloads, delivered.

65-72 Cr, 2% max. Si.

0.025% C	34.50	0.20% C	33.50
0.06% C	34.50	0.50% C	33.25
0.10% C	34.00	1.00% C	33.00
0.15% C	33.75	2.00% C	32.75

65-69% Cr, 4.9% C 24.75
62-66% Cr, 4.6% C, 6-9% Si 25.50

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60.65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads 25.85
Ton lots 28.00
Less ton lots 29.50

High-Nitrogen Ferrochrome

Low-carbon type 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C $1.18
0.50% max. C 1.14
9 to 11% C 1.11

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed, lump 4-in. x down, 24.75¢ per lb contained Cr plus 10.80¢ per lb contained Si. Bulk 2-in. x down, 25.05¢ per lb contained Cr plus 10.80¢ per lb contained Si. Bulk 1-in. x down, 25.25¢ per lb contained Cr plus 11.00¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads 19.00
Ton lots 22.10
Less ton lots 23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads 20.00
Ton lots 22.30
Less ton lots 23.30

5MZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots 17.50
Less ton lots 19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots 16.60
Ton lots 18.10
Less ton lots 19.35

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed 17.50
Ton lots to carload packed 18.50
Less ton lots 20.00

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 75 pct Mn;

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	10.00
Clairton, Pa.	10.00
Sheridan, Pa.	10.00

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk 12.50
Ton lots, packed 14.05

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$84.00
19 to 21%	3% max.	86.00
21 to 23%	3% max.	88.50
23 to 25%	3% max.	91.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed 36.95
Ton lots 38.45

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads 30.00
Ton lots 32.00
250 to 1999 lb 34.00
Less than 250 lb 37.00
Premium for hydrogen-removed metal 1.50

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ..... 21.25¢

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	30.00	31.85	33.05
0.07% max. C	27.95	29.80	31.00
0.15% max. C	27.45	29.30	30.50
0.30% max. C	26.95	28.80	30.00
0.50% max. C	26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30	26.50

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.

Carload bulk 11.00
Ton lots 12.65
Briquet contract basis carlots, bulk, delivered, per lb of briquet 12.65
Ton lots, packed 14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $92.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $89.50. Add $1.00 per ton for each additional 0.50% Si up to and including 17%. Add $1.45 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton Lots	Carloads
96% Si, 2% Fe	20.10	18.00
97% Si, 1% Fe	20.60	18.50

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk 6.30
Ton lots 7.90

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	13.80
50% Si	10.80	85% Si	15.55
65% Si	12.20	90.95% Si	17.00

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

35-55% contract, basis, delivered, per pound, contained V.

Openhearth ..... $3.00-$3.10
Crucible 3.10- 3.20
High speed steel (Primos) .. 3.20- 3.25

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis f.o.b. Suspension Bridge, N. Y., per lb.

Carloads ..... 9.25¢
Ton lots 10.15

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.15

Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots $3.50
Less ton lots 3.75

Ferro-Tantalum-Columbium, 20% Ta, 40% Cb, 0.30% C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $4.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo $1.13

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload $110.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagra Falls, N. Y., and Bridgeville, Pa., freight, allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots 1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton $177.00

Ferrotungsten, ¼ x down, packed, per pound contained W, ton lots, f.o.b. $2.15

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. $1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.13

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound

Carload, bulk lump ..... 14.50¢
Ton lots, bulk lump ..... 15.75¢
Less ton lots, lump ..... 16.25¢

Vanadium Pentoxide, 86-89% V_2O_5 contract basis, per pound Contained V_2O_5 ..... $1.20

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.

Ton lots $1.90

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.

Carload, bulk ..... 8.00¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B.... $3.35

Bortam, f.o.b. Niagara Falls

Ton lots, per pound ..... 45¢
Less ton lots, per pound ... 60¢

Corbortam, Ti 15-21%, B 1-3%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots per pound ..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, Ton lots ... $1.20
F.o.b. Wash., Pa.; 100 lb up
10 to 14% B ..... .85
14 to 19% B 1.30
19% min. B 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over

No. 1 ..... $1.00
No. 6 ..... 65¢
No. 79 ..... 50¢

Manganese-Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots $1.40
Less ton lots 1.55

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max C, 3.00% max. Fe, balance Ni, delivered

Less ton lots $2.10

Silcas, contract basis, delivered

Ton lots ..... 45.00¢